Appendix S Snake River Maps

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FEASIBILITY STUDY DOCUMENTATION

Document Title

Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement

Appendix A (bound with B) Anadromous Fish Modeling

Appendix B (bound with A) Resident Fish
Appendix C Water Quality

Appendix D Natural River Drawdown Engineering

Appendix E Existing Systems and Major System Improvements Engineering

Appendix F (bound with G, H) Hydrology/Hydraulics and Sedimentation

Appendix G (bound with F, H) Hydroregulations

Appendix H (bound with F, G) Fluvial Geomorphology

Appendix I Economics

Appendix J Plan Formulation

Appendix K Real Estate

Appendix L (bound with M) Lower Snake River Mitigation History and Status

Appendix M (bound with L) Fish and Wildlife Coordination Act Report

Appendix N (bound with O, P) Cultural Resources

Appendix O (bound with N, P) Public Outreach Program

Appendix P (bound with N, O) Air Quality

Appendix Q (bound with R, T) Tribal Consultation and Coordination

Appendix R (bound with Q, T) Historical Perspectives

Appendix S* Snake River Maps

Appendix T (bound with R, Q) Clean Water Act, Section 404(b)(1) Evaluation

Appendix U Response to Public Comments

*Appendix S, Lower Snake River Maps, is bound separately (out of order) to accommodate a special 11 x 17 format.

The documents listed above, as well as supporting technical reports and other study information, are available on our website at http://www.nww.usace.army.mil/lsr. Copies of these documents are also available for public review at various city, county, and regional libraries.

STUDY OVERVIEW

Purpose and Need

Between 1991 and 1997, due to declines in abundance, the National Marine Fisheries Service (NMFS) made the following listings of Snake River salmon or steelhead under the Endangered Species Act (ESA) as amended:

- sockeye salmon (listed as endangered in 1991)
- spring/summer chinook salmon (listed as threatened in 1992)
- fall chinook salmon (listed as threatened in 1992)
- steelhead (listed as threatened in 1997).

In 1995, NMFS issued a Biological Opinion on operations of the Federal Columbia River Power System (FCRPS). Additional opinions were issued in 1998 and 2000. The Biological Opinions established measures to halt and reverse the declines of ESA-listed species. This created the need to evaluate the feasibility, design, and engineering work for these measures.

The Corps implemented a study (after NMFS' Biological Opinion in 1995) of alternatives associated with lower Snake River dams and reservoirs. This study was named the Lower Snake River Juvenile Salmon Migration Feasibility Study (Feasibility Study). The specific purpose and need of the Feasibility Study is to evaluate and screen structural alternatives that may increase survival of juvenile anadromous fish through the Lower Snake River Project (which includes the four lowermost dams operated by the Corps on the Snake River—Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Dams) and assist in their recovery.

Development of Alternatives

The Corps' response to the 1995 Biological Opinion and, ultimately, this Feasibility Study, evolved from a System Configuration Study (SCS) initiated in 1991. The SCS was undertaken to evaluate the technical, environmental, and economic effects of potential modifications to the configuration of Federal dams and reservoirs on the Snake and Columbia Rivers to improve survival rates for anadromous salmonids.

The SCS was conducted in two phases. Phase I was completed in June 1995. This phase was a reconnaissance-level assessment of multiple concepts including drawdown, upstream collection, additional reservoir storage, migratory canal, and other alternatives for improving conditions for anadromous salmonid migration.

The Corps completed a Phase II interim report on the Feasibility Study in December 1996. The report evaluated the feasibility of drawdown to natural river levels, spillway crest, and other improvements to existing fish passage facilities.

Based in part on a screening of actions conducted for the Phase I report and the Phase II interim report, the study now focuses on four courses of action:

- Existing Conditions
- Maximum Transport of Juvenile Salmon

- Major System Improvements
- Dam Breaching.

The results of these evaluations are presented in the combined Feasibility Report (FR) and Environmental Impact Statement (EIS). The FR/EIS provides the support for recommendations that will be made regarding decisions on future actions on the Lower Snake River Project for passage of juvenile salmonids. This appendix is a part of the FR/EIS.

Geographic Scope

The geographic area covered by the FR/EIS generally encompasses the 140-mile long lower Snake River reach between Lewiston, Idaho and the Tri-Cities in Washington. The study area does slightly vary by resource area in the FR/EIS because the affected resources have widely varying spatial characteristics throughout the lower Snake River system. For example, socioeconomic effects of a permanent drawdown could be felt throughout the whole Columbia River Basin region with the most effects taking place in the counties of southwest Washington. In contrast, effects on vegetation along the reservoirs would be confined to much smaller areas.

Identification of Alternatives

Since 1995, numerous alternatives have been identified and evaluated. Over time, the alternatives have been assigned numbers and letters that serve as unique identifiers. However, different study groups have sometimes used slightly different numbering or lettering schemes and this has led to some confusion when viewing all the work products prepared during this long period. The primary alternatives that are carried forward in the FR/EIS currently involve the following four major courses of action:

Alternative Name	PATH ^{1/} Number	Corps Number	FR/EIS Number
Existing Conditions	A-1	A-1	1
Maximum Transport of Juvenile Salmon	A-2	A-2a	2
Major System Improvements	A-2'	A-2d	3
Dam Breaching	A-3	A-3a	4

¹/ Plan for Analyzing and Testing Hypotheses

Summary of Alternatives

The Existing Conditions Alternative consists of continuing the fish passage facilities and project operations that were in place or under development at the time this Feasibility Study was initiated. The existing programs and plans underway would continue unless modified through future actions. Project operations include fish hatcheries and Habitat Management Units (HMUs) under the Lower Snake River Fish and Wildlife Compensation Plan (Comp Plan), recreation facilities, power generation, navigation, and irrigation. Adult and juvenile fish passage facilities would continue to operate.

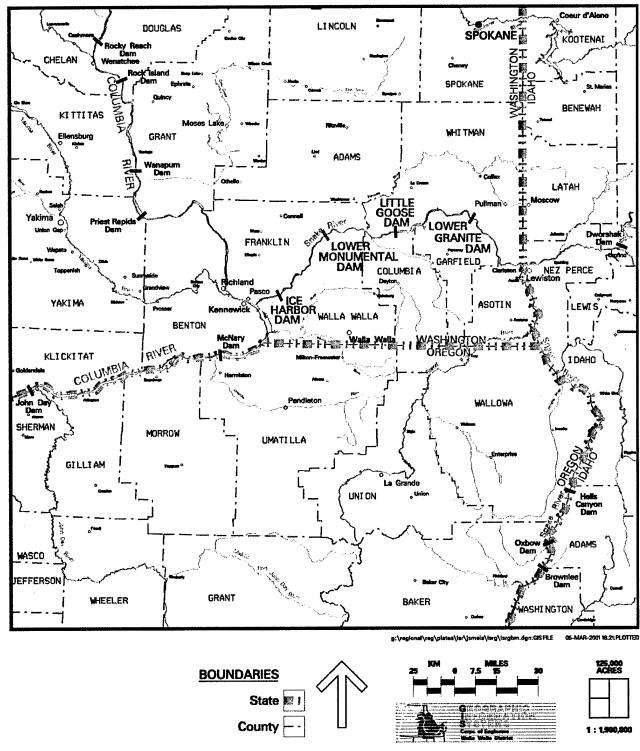
The Maximum Transport of Juvenile Salmon Alternative would include all of the existing or planned structural and operational configurations from the Existing Conditions Alternative. However, this alternative assumes that the juvenile fishway systems would be operated to maximize fish transport from Lower Granite, Little Goose, and Lower Monumental and that voluntary spill would not be used to bypass fish through the spillways (except at Ice Harbor). To accommodate this maximization of transport, some measures would be taken to upgrade and improve fish handling facilities.

The Major System Improvements Alternative would provide additional improvements to what is considered under the Existing Conditions Alternative. These improvements would be focused on using surface bypass facilities such as surface bypass collectors (SBCs) and removable spillway weirs (RSWs) in conjunction with extended submerged bar screens (ESBSs) and a behavioral guidance structure (BGS). The intent of these facilities would be to provide more effective diversion of juvenile fish away from the turbines. Under this alternative, an adaptive migration strategy would allow flexibility for either in-river migration or collection and transport of juvenile fish downstream in barges and trucks.

The Dam Breaching Alternative has been referred to as the "Drawdown Alternative" in many of the study groups since late 1996 and the resulting FR/EIS reports. These two terms essentially refer to the same set of actions. Because the term drawdown can refer to many types of drawdown, the term dam breaching was created to describe the action behind the alternative. The Dam Breaching Alternative would involve significant structural modifications at the four lower Snake River dams, allowing the reservoirs to be drained and resulting in a free-flowing yet controlled river. Dam breaching would involve removing the earthen embankment sections of the four dams and then developing a channel around the powerhouses, spillways, and navigation locks. With dam breaching, the navigation locks would no longer be operational and navigation for large commercial vessels would be eliminated. Some recreation facilities would close while others would be modified and new facilities could be built in the future. The operation and maintenance of fish hatcheries and HMUs would also change, although the extent of change would probably be small and is not known at this time.

Authority

The four Corps dams of the lower Snake River were constructed and are operated and maintained under laws that may be grouped into three categories: 1) laws initially authorizing construction of the project, 2) laws specific to the project passed subsequent to construction, and 3) laws that generally apply to all Corps reservoirs.



LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

REGIONAL BASE MAP

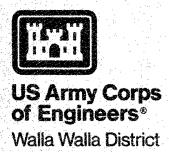
Form Approved REPORT DOCUMENTATION PAGE OMB No. 0704-0188 Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. 1. AGENCY USE ONLY (Leave blank) 2. REPORT DATE 3. REPORT TYPE AND DATES COVERED February 2002 Final 4. TITLE AND SUBTITLE 5. FUNDING NUMBERS Lower Snake River Juvenile Salmon Migration Feasibility Report/ Environmental Impact Statement and Appendices 5 SNAKE RVER MAPS 6. AUTHOR(S) Corp of Engineers, Walla Walla District 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 8. PERFORMING ORGANIZATION US Army Corps of Engineers REPORT NUMBER Walla Walla District 201 N Third Ave Walla Walla WA 99362-1876 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) 10. SPONSORING/MONITORING AGENCY REPORT NUMBER US Army Corps of Engineers Wash, DC 20314-1000 11. SUPPLEMENTARY NOTES Cooperating Agencies: US Environmental Protection Agency; Bonneville Power Administration; US Bureau of Reclamation 12a. DISTRIBUTION AVAILABILITY STATEMENT 12b. DISTRIBUTION CODE Approval for public release; Distribution is unlimited 13. ABSTRACT (Maximum 200 words) This Final Feasibility Report/Environmental Impact Statement (RE/EIS) and its 21 appendices document the results of a comprehensive analysis of the four dams on the lower Snake River (collectively called the Lower Snake River Project) and their effects on four lower Snake River salmon and steelhead stocks listed for protection under the Endangered Species Act (ESA). The U.S. Army Corps of Engineers (Corps), along with Bonneville Power Agency (BPA), U.S. Environmental Protection Agency (EPA), and U. S. Bureau of Reclamation (BOR) as cooperating agencies, analyzed four alternatives to evaluate the best way to improve juvenile salmon migration through Lower Snake River Project. The Final FR/EIS includes the best available information on the biological effectiveness, engineering components, costs, economic effects, and other environmental effects associated with the four alternatives: Alternative 1-Existing Conditions, Alternative 2-Maximum Transport of Juvenile Salmon, Alternative 3-Major System Improvements (Adaptive Migration), and Alternative 4-Dam Breaching. In the Final FR/EIS, the Corps identifies Alternative 3-Major System Improvements (Adaptive Migration) as the recommended plan (preferred alternative) and explains the process for selecting that alternative. 14. SUBJECT TERMS 15. NUMBER OF PAGES Approval for public release; Distribution is unlimited 16. PRICE CODE 17. SECURITY CLASSIFICATION 18. SECURITY CLASSIFICATION 19. SECURITY CLASSIFICATION 20. LIMITATION OF ABSTRAC OF REPORT OF THIS PAGE **OF ABSTRACT**

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Final Lower Snake River Juvenile Salmon Migration Feasibility Report/ Environmental Impact Statement

Appendix S Snake River Maps

Produced by
U.S. Army Corps of Engineers
Walla Walla District

February 2002

FOREWORD

Appendix S was prepared by the U.S. Army Corps of Engineers (Corps), Walla Walla District. This appendix is one part of the overall effort of the Corps to prepare the Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement (FR/EIS).

The Corps has reached out to regional stakeholders (Federal agencies, tribes, states, local governmental entities, organizations, and individuals) during the development of the FR/EIS and appendices. This effort resulted in many of these regional stakeholders providing input and comments, and even drafting work products or portions of these documents. This regional input provided the Corps with an insight and perspective not found in previous processes. A great deal of this information was subsequently included in the FR/EIS and appendices; therefore, not all of the opinions and/or findings herein may reflect the official policy or position of the Corps.

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ACRONYMS AND ABBREVIATIONS

3-D three dimensional

dpi dots per inch

GIS geographic information system LSRP Lower Snake River Project

NGVD29 National Geodetic Vertical Datum 1929

RM River Mile USE U.S. Engineer

1. Introduction

This appendix is intended to share maps and aerial photo displays of the Lower Snake River Project (LSRP). These presentations give the reader insight into the LSRP prior to dam construction (before 1961) and after dam construction (after 1975).

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2. Mapping Products

2.1 1934 Survey Drawings

Documented surveys with depth-soundings on the LSRP were first conducted in the late 1800s. Only two depth-sounding surveys cover the entire LSRP and these were completed in 1917 and 1934. The 1934 survey was chosen for this appendix because it contains much more detail. Since 1934, depth-sounding surveys were conducted only on selected areas within the LSRP. The figures in this appendix are from the original linen drawings.

2.1.1 Type of Data

The survey drawings are a collection of 155 sheets covering 176 river miles, beginning at the mouth of the Snake River (River Mile 0.0) and were originally drawn at the scale of 1:2,000.

The 1934 drawings include the following information:

- topographic contours (5 foot)
- shoreline
- ground descriptions (grass, sand, cultivated)
- sounding depths
- depth contours (6 and 9 foot)
- proposed navigation channel centerline
- northing/easting and longitude/latitude tick marks
- U.S. Engineer (U.S.E.) bench marks
- river miles (not the same as reservoir river miles)

- roads and railroads
- substrate information
- islands
- low water elevation marks
- buildings
- rapids (average and maximum velocity)
- spot elevations
- monument stations

2.1.2 Original Purpose

The drawings are taken from a larger report entitled Review Report, Snake River, Washington-Idaho, Mouth to Oregon-Washington Line, dated June 10, 1935, by the U.S. Engineer Office, Portland, Oregon. Sounding data was taken to determine a proposed navigation channel, document the topography, and site locations of rapids.

2.1.3 Survey Components

The method of survey is not known because the associated report or other documentation was not found with the drawings. The original maps were prepared on linen media. Notes on the drawings identify the following creation specifics:

- Elevations are referred to as National Geodetic Vertical Datum 1929 (NGVD29) (U.S.C and G.S. Datum 1929 adjustment).
- Soundings are in feet and tenths and show depths at adopted low water plane (based on 0.0 at U.S. Weather Bureau gage at Riparia, El 512.05 NGVD29).
- Figures in parentheses indicate height in feet above low water (for example, 1.7).

- Contour interval is 5 feet.
- Distance in miles from mouth of river is measured on the centerline of the proposed channel.

2.1.4 Electronic Conversions and Processing

In 1998 the Walla Walla District converted the 1934 drawings to 3-D geographic information system (GIS) files. At the same time the approximately 126,000 sounding points (depth of river) were also converted into 3-D GIS files with horizontal and vertical values. The drawings were scanned at 200 dots per inch (dpi). Longitude and latitude tick mark information was taken from the drawings, inputted into files, and labeled. During data verification of the longitude and latitude tick mark locations, the tick marks were found not to match current coordinate systems, so drawings do not correctly overlay current topographic data. Images were geographically referenced into position using the longitude and latitude locations from the drawings. The raster line work was then converted into 3-D vector data with each reservoir reach as the upper and lower boundary for that section of the river.

2.2 Aerial Photography

2.2.1 1956 to 1962

Aerial photography flown between 1956 and 1962 was stereoplotted to develop topographic mapping. The topographic mapping was used to geographically reference the 1958 aerial photography that represents the pre-project condition for the LSRP. See Table 2.1 for aerial flight details.

2.2.2 1958, 1991, and 1992

Aerial photography was flown in 1958, 1991, and 1992 for the purpose of recording what the river looked like during that time period. The 1958 aerial flight documents the appearance of the lower Snake River prior to dam construction. The 1991 and 1992 flights provide information used in managing recreation areas and wildlife habitat units within the boundaries of the LSRP. See Table 2.1 for aerial flight details.

Table 2-1. Aerial Flight Information

Decarintion	Roll	Date	Cools	0/ 01	Construct.
Description	Number	Flown	Scale	% Overlap	Control
1956 Snake River					
Snake River Mouth to Riparia	W56-52V	14 Sep	1:20,700	60	Yes
4058 C. J. D.					
1957 Snake River	*****	10.0	10.000		••
Lake Herbert G. West	W57-70V	10 Sep	1:9,600	60	Yes
Lake Herbert G. West	W57-71V	12 Oct	1:9,600	60	Yes
1958 Snake River					
Low Water RM 10 to Johnson Bar	W58-74V	28 Aug	1:10,000	Minimum	No
Low Water — RM 10 to Johnson Bar	W58-75V	28 Aug	1:10,000	Minimum	No
1959 Snake River					
Lake Bryan	W59-93V	2 Nov	1:9,600	60	Yes
Lake Bryan	W59-94V	6 Nov	1:9,600	60	Yes
Lake Bryan	W59-95V	14 Nov	1:20,000	60	Yes
Lake Bryan	W59-95V	30 Nov	1:20,000	60	Yes
1960 Snake River		•			
Lower Granite Lake—Low Altitude	W60-8	1 Dec	1:9,600	60	Yes
Lower Granite Lake—Low Altitude	W60-9	13 Dec	1:9,600	60	Yes
1991 Snake River					
RM 0.0 to Lower Monumental Dam	W91-03	30 Aug	1:24,000	60	Yes
1992 Snake River					
Lower Monumental Dam to Asotin	W92-12	19 Apr	1:24,000	60	Yes

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3. Map Presentations

3.1 Survey Drawing Displays

The 1934 mapping found in Annex A is a subset of the entire mapping collection. Only 131 sheets were selected to represent the LSRP, starting at the mouth of the Snake River to a point above Asotin, WA. An index map in the front of the collection helps the reader select sheets of interest.

3.2 Pre- and Post-Dam Comparison Displays

A total of 22 pre- and post-dam comparison displays have been compiled and are found in Annex B. Each display is of a particular geographic location on the lower Snake River. Aerial photography from 1958, 1991, and 1992 are compared showing pre- and post-dam shorelines along with post-dam shoreline superimposed on the 1958 photo. In addition, up to three oblique photos, taken between 1958 and 1960, are presented with a relationship to the 1958 aerial photo. For those locations where fewer than three photos are available, there is a blank area on the sheet. There are six displays from the river and reservoir between Ice Harbor and Lower Monumental Dams, seven displays between Lower Monumental and Little Goose Dams, eight displays between Little Goose and Lower Granite Dams, and one display from Lower Granite Dam to Clarkston.

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Annex A

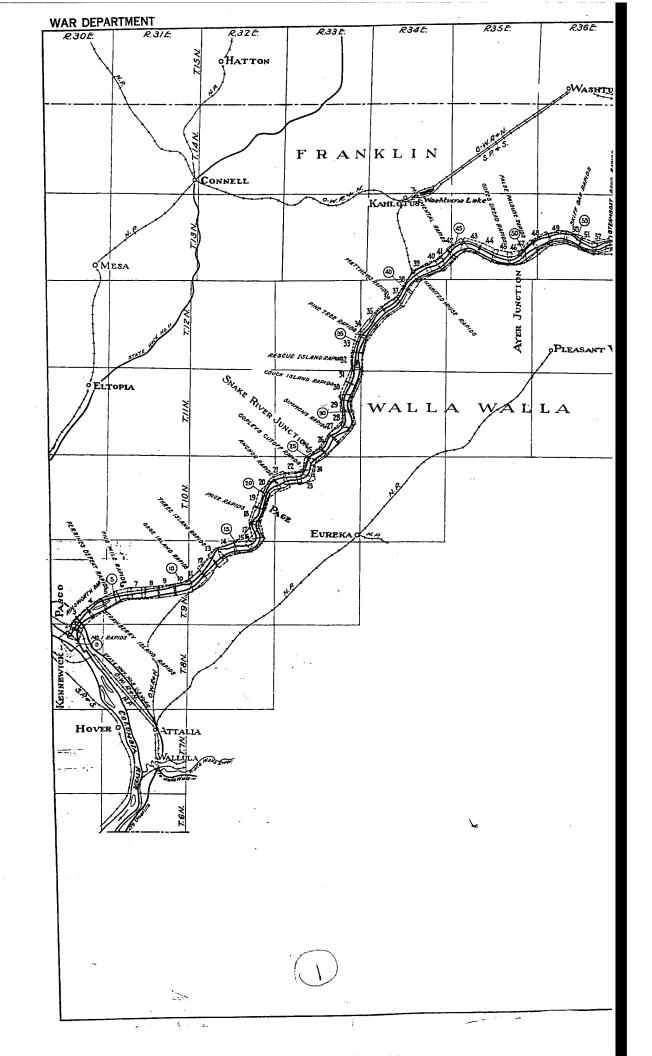
1934 SURVEY DRAWINGS: SHEET NUMBERS 1 THROUGH 131 AND OVERVIEW SHEET

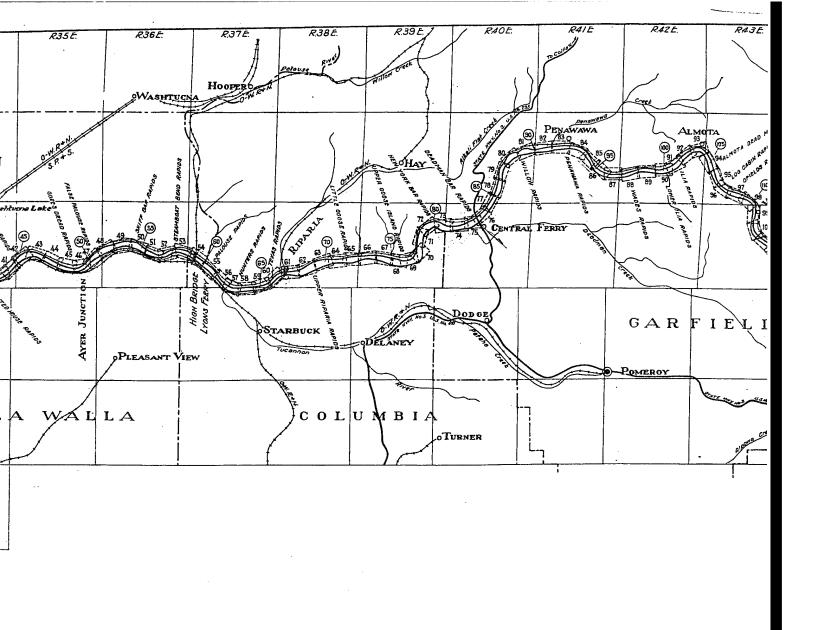
PROJECT Lower Snake River	SHEET NUMBER SN-1-12/0	PLATE DISCRIPTION Index Map
McNary	SN-1-12/1	Confluence of Snake and Columbia Rivers / Rapid No. 1
	SN-1-12/2	Sacagawea Park
	SN-1-12/3	Ainsworth Bar
	SN-1-12/4	Strawberry Island / Strawberry Island Rapids
	SN-1-12/5	Perrines Defeat Rapids / Potato Patch Shoal
	SN-1-12/6	Five Mile Rapids
	SN-1-12/7	
	SN-1-12/8	Tiger Head Crossing
	SN-1-12/9	Goose Island / Tiger Head Point
Ice Harbor	SN-1-12/10	Ice Harbor
ice Harbor	SN-1-12/11	Gauge Island Rapids / Hard Rock Point
	SN-1-12/12	Levey Rapids
	SN-1-12/13	Three Island Rapids
	SN-1-12/14	Three Island Rapids
	SN-1-12/15	
	SN-1-12/16	Fish Hook Rapids
	SN-1-12/17	1 ish 1100k Kupius
	SN-1-12/18	Page Rapids / Hammer Island
	SN-1-12/19	Page
	SN-1-12/20	Anchor Canyon
	SN-1-12/21	Anchor Rapids
	SN-1-12/22	
	SN-1-12/23	Copley's Cutoff Rapids
	SN-1-12/24	1 7
	SN-1-12/25	Snake River Junction
	SN-1-12/26	
	SN-1-12/27	Simmons Rapids / Sheffler
	SN-1-12/28	Ford Island
	SN-1-12/29	Walker
	SN-1-12/30	Couch Island Rapids
	SN-1-12/31	Long Crossing Bar
	SN-1-12/32	Rescue Island Rapids
	SN-1-12/33	
	SN-1-12/34	Pine Tree Rapids / Scott / Burr Canyon
	SN-1-12/35	Sturgeon Bay
Ice Harbor (cont.)	SN-1-12/36	Matthews Rapids / Windust
	SN-1-12/37	Matthews
Lower Monumental	SN-1-12/38	
	SN-1-12/39	Haunted House Rapids
	SN-1-12/40	Ruxby
	SN-1-12/41	
	SN-1-12/42	Monumental Rapids / Magallon
	SN-1-12/43	Three Springs Shoal
	SN-1-12/44	

PROJECT	SHEET NUMBER	PLATE DISCRIPTION
	SN-1-12/45	
	SN-1-12/46	Gore's Dread Rapids / Ayer Junction
	SN-1-12/47	False Palouse Rapids
	SN-1-12/48	Rifton
	SN-1-12/49	
	SN-1-12/50	Skiff Bar Rapids
	SN-1-12/51	
	SN-1-12/52	
	SN-1-12/53	Steamboat Bend Rapids / Perry
	SN-1-12/54	Confluence of Palouse and Snake Rivers /
		Lyon's Ferry
	SN-1-12/55	Palouse Rapids
	SN-1-12/56	Confluence of Tucannon and Snake Rivers
	SN-1-12/57	Hunter's Rapids / Tucannon
	SN-1-12/58	
	SN-1-12/59	Texas Rapids
	SN-1-12/60	
	SN-1-12/61	Riparia
	SN-1-12/62	Upper Riparia Rapids / McGuire's Rapids
Little Goose	SN-1-12/63	
	SN-1-12/64	
	SN-1-12/65	Little Goose Rapids / Little Goose Island / Flagpole
	SN-1-12/66	. mgpore
	SN-1-12/67	
	SN-1-12/68	Upper Goose Island Rapids
	SN-1-12/69	Ridpath
	SN-1-12/70	Dry Gulch
	SN-1-12/71	Diy Guien
Little Goose (cont.)	SN-1-12/72	New York Bar Rapids
	SN-1-12/73	Diamond Crossing
	SN-1-12/74	Diamond Crossing Rapids / Central Ferry
	SN-1-12/75	Deadman Bar Rapids / Central Ferry Bridge
	SN-1-12/76	Studium But Rapids / Central Ferry Bridge
	SN-1-12/77	
	SN-1-12/78	Purrington
	SN-1-12/79	· Willigton
	SN-1-12/80	Willow Rapids / Willow Island
	SN-1-12/81	Willow Inpido / Willow Island
	SN-1-12/82	
	SN-1-12/83	Penawawa Rapids / Penawawa
	SN-1-12/84	1 onavava rapids i onavava
	SN-1-12/85	Rice's Bar Rapids
	SN-1-12/86	
	SN-1-12/87	Swift
	SN-1-12/88	Wade's Rapids / Atwoods Island
	SN-1-12/89	
	SN-1-12/90	Lower Illia Rapids
	SN-1-12/91	Illia Rapids / Pine Tree Island / Illia
		1 The second of

PROJECT	SHEET NUMBER	PLATE DISCRIPTION
	SN-1-12/92	
	SN-1-12/93	Almota Rapids / Almota
	SN-1-12/94	Almota Dead March Rapids
	SN-1-12/95	
Lower Granite	SN-1-12/96	Log Cabin Rapids / Crampton
	SN-1-12/97	Offields Rapids / Log Cabin Island / Offields Bar
	SN-1-12/98	Interior
	SN-1-12/99	Wawawai
	SN-1-12/100	Crum
	SN-1-12/101	
	SN-1-12/102	Granite Point Rapids / Granite Point
	SN-1-12/103	King Ranch
	SN-1-12/104	Truax Rapids
	SN-1-12/105	Bishop
	SN-1-12/106	Kelley's Island Rapids / Kelly Ranch
	SN-1-12/107	Upper Kelley's Rapids
	SN-1-12/108	• •
	SN-1-12/109	Indian / Judkins Grain Warehouse
Lower Granite (cont.)	SN-1-12/110	Tramway Rapids
	SN-1-12/111	•
	SN-1-12/112	Little Pine Tree Rapids
	SN-1-12/113	•
	SN-1-12/114	Steptoe Rapids
	SN-1-12/115	Alpowa Rapids
	SN-1-12/116	Alpowa
	SN-1-12/117	-
	SN-1-12/118	
	SN-1-12/119	Wilma
	SN-1-12/120	Dry Gulch Rapids
	SN-1-12/121	Dead March Rapids / Dry Gulch Island
	SN-1-12/122	
	SN-1-12/123	Clarkston Rapids
	SN-1-12/124	Confluence of Clearwater and Snake Rivers /
	SN-1-12/125	Lewiston Rapids / Lewiston / Clarkston Clarkston Beach
	SN-1-12/125 SN-1-12/126	
	SN-1-12/127	Slaughter House Rapids Lower Swallow's Nest Panids or Poethouse
		Lower Swallow's Nest Rapids or Pesthouse Rapids
	SN-1-12/128	Upper Swallow's Nest Rapids / Lower Asotin
	SN-1-12/129	Upper Asotin Rapids
	SN-1-12/130	Asotin
	SN-1-12/131	

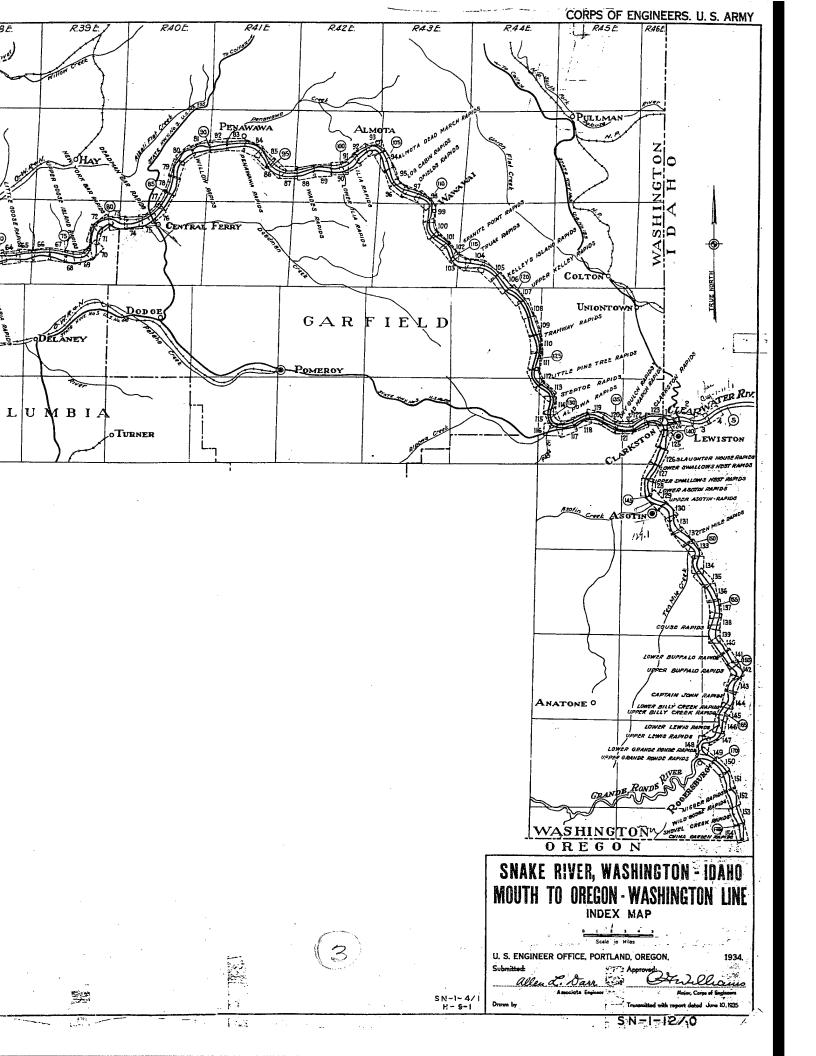
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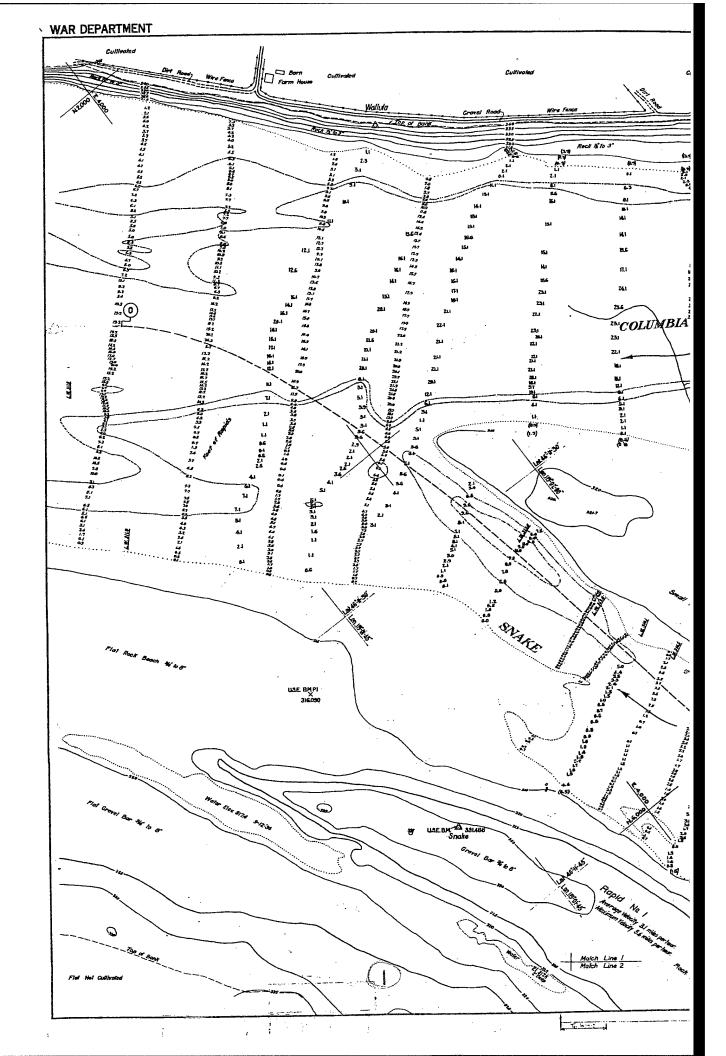


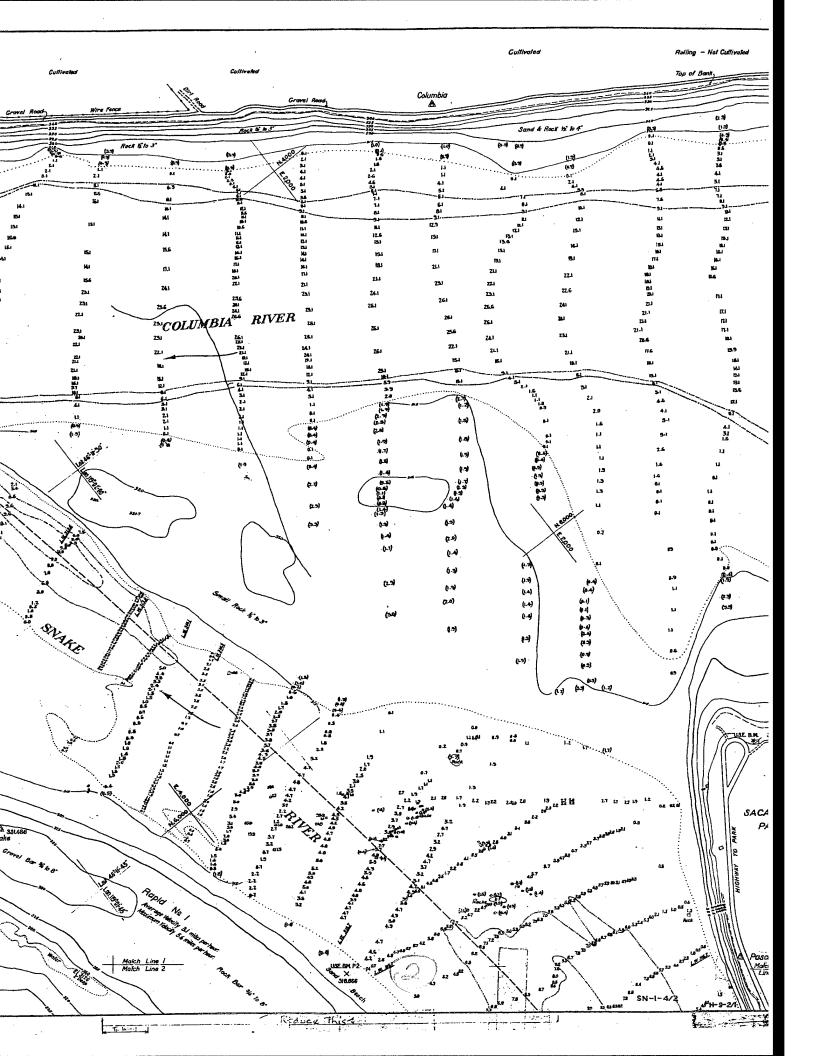


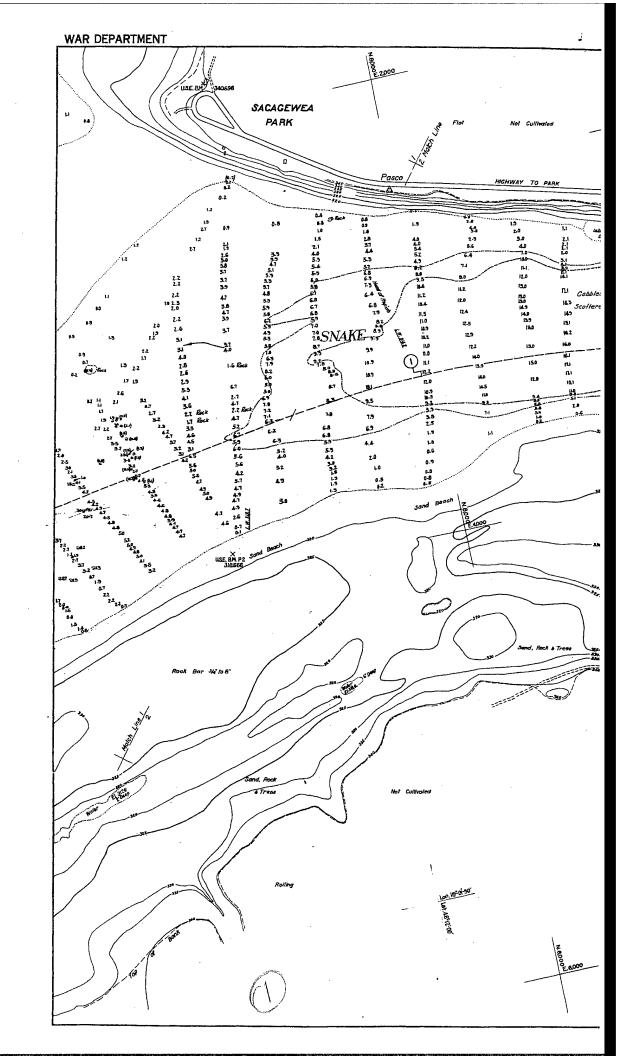
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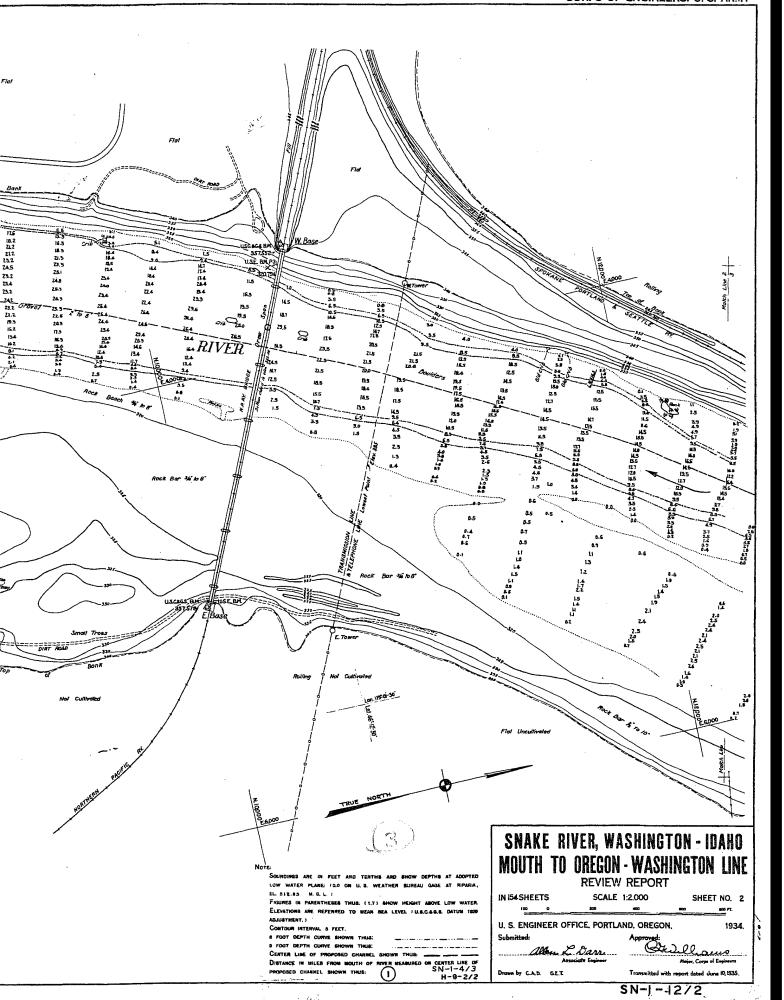


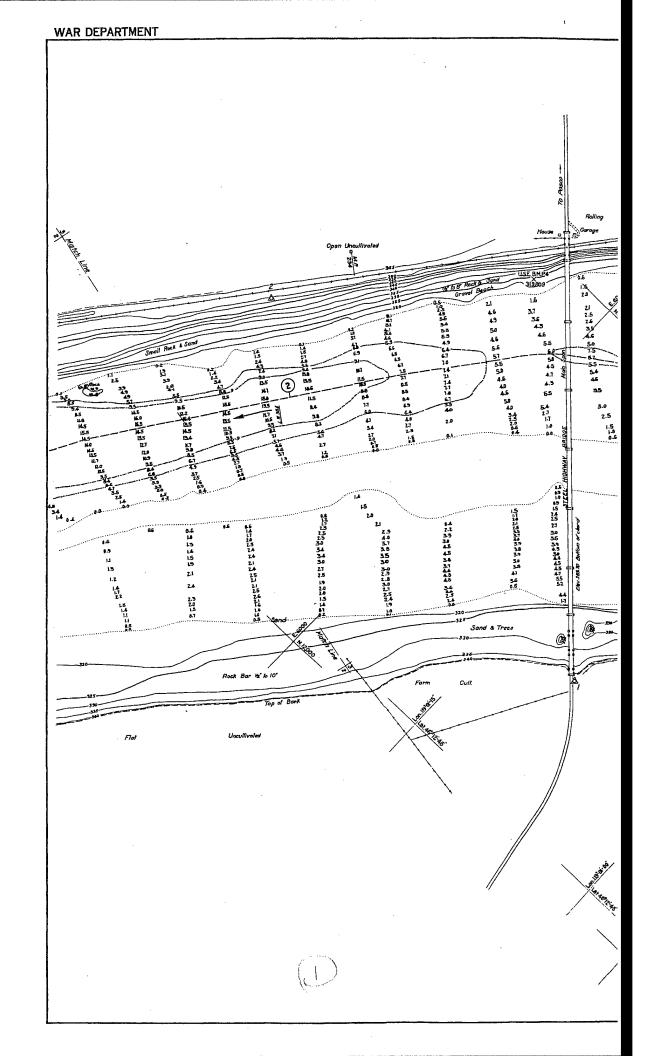


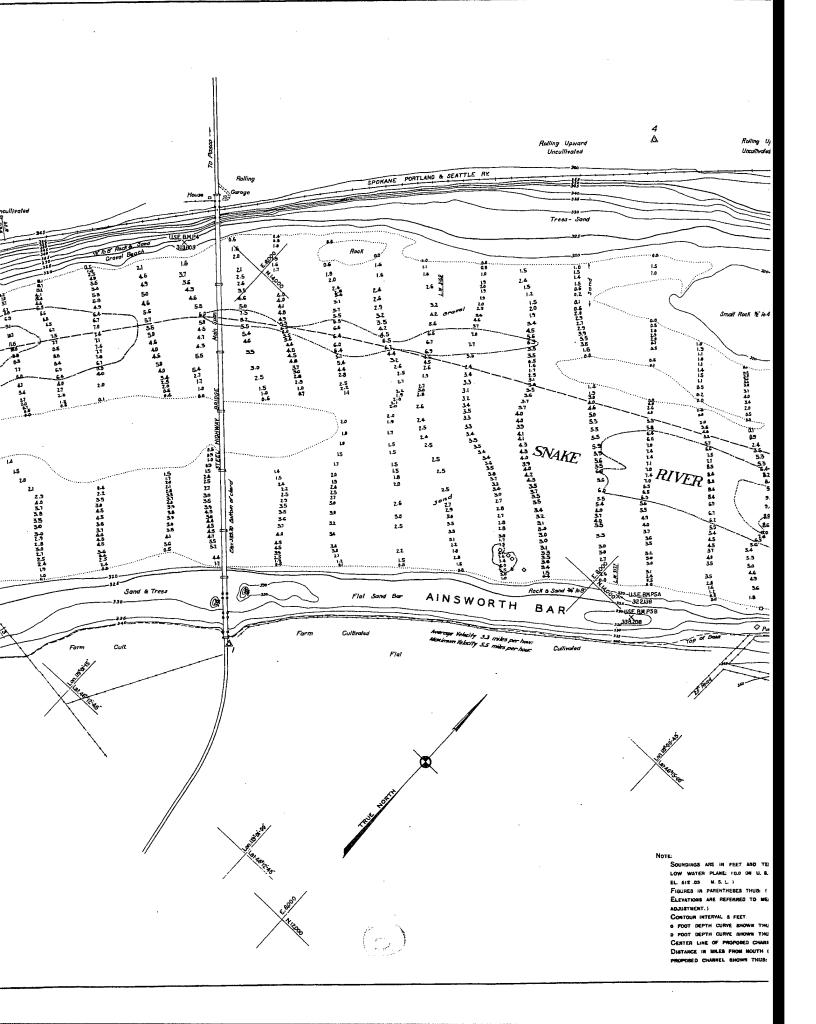


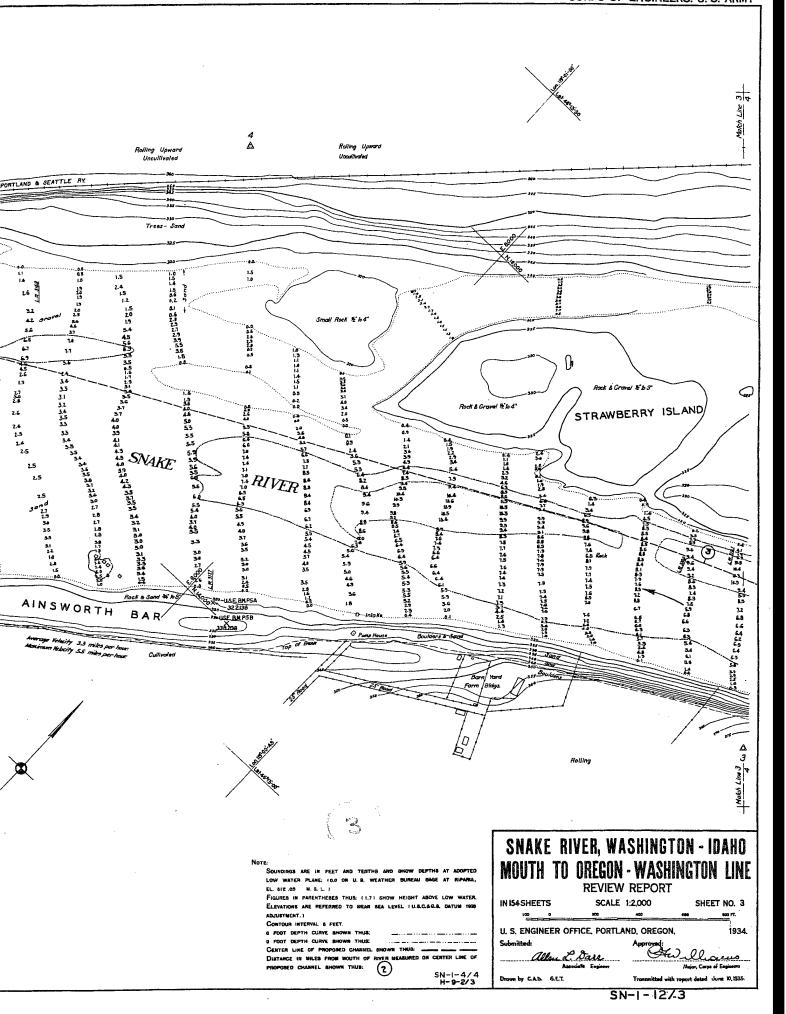


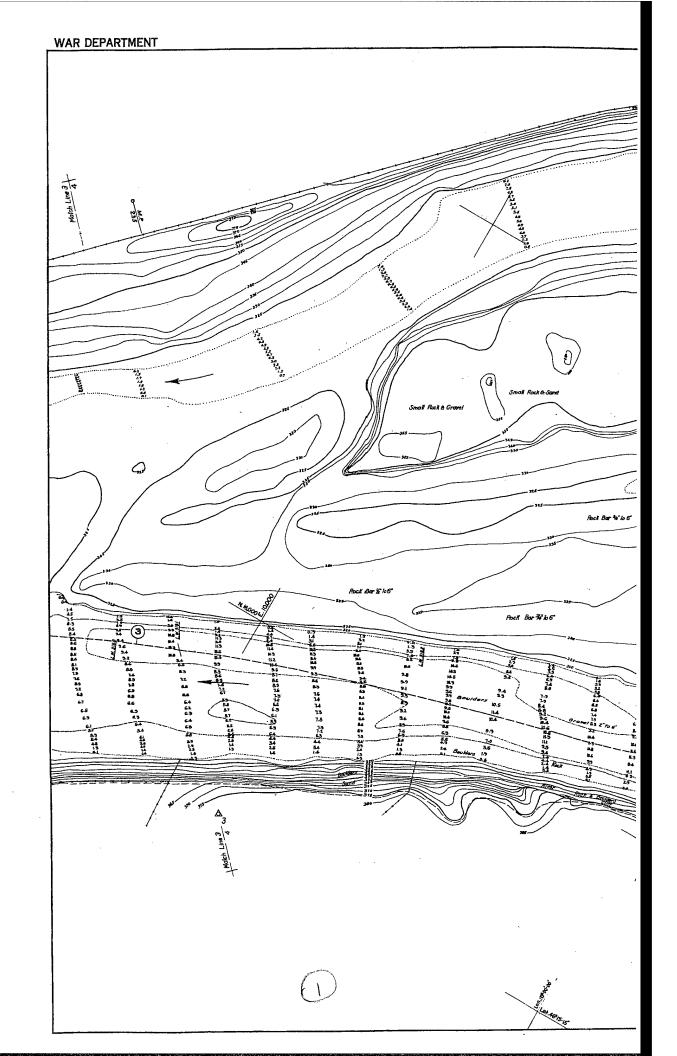


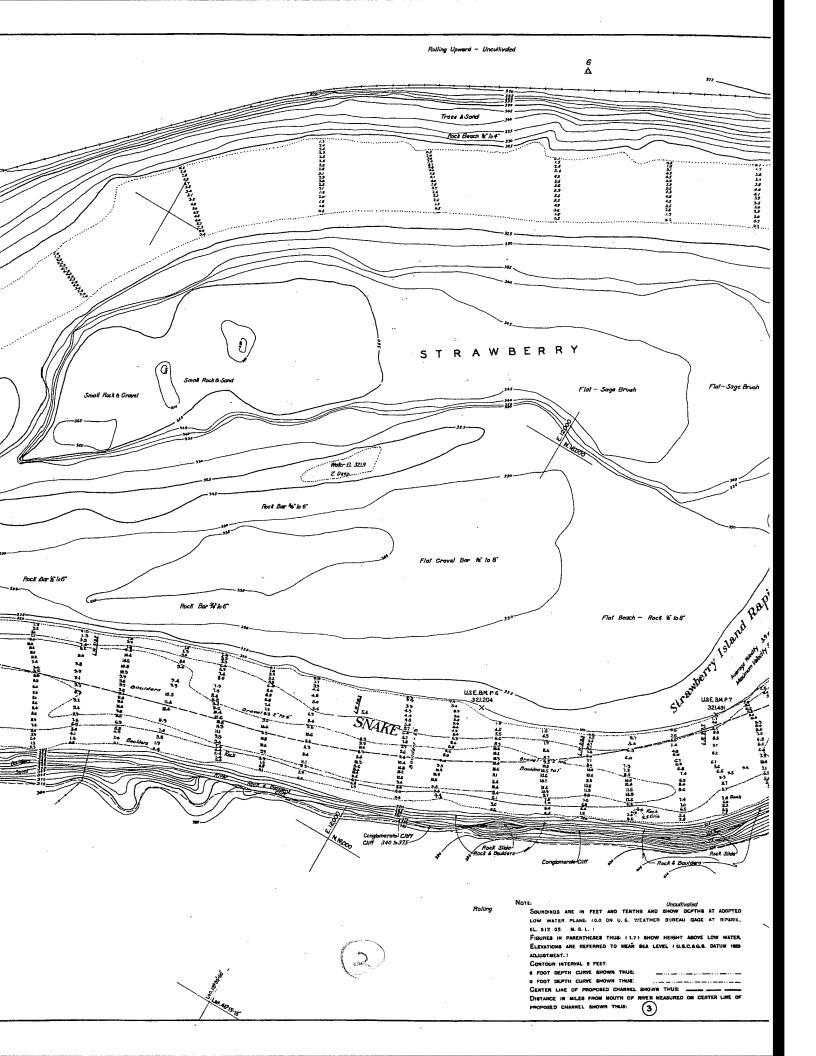


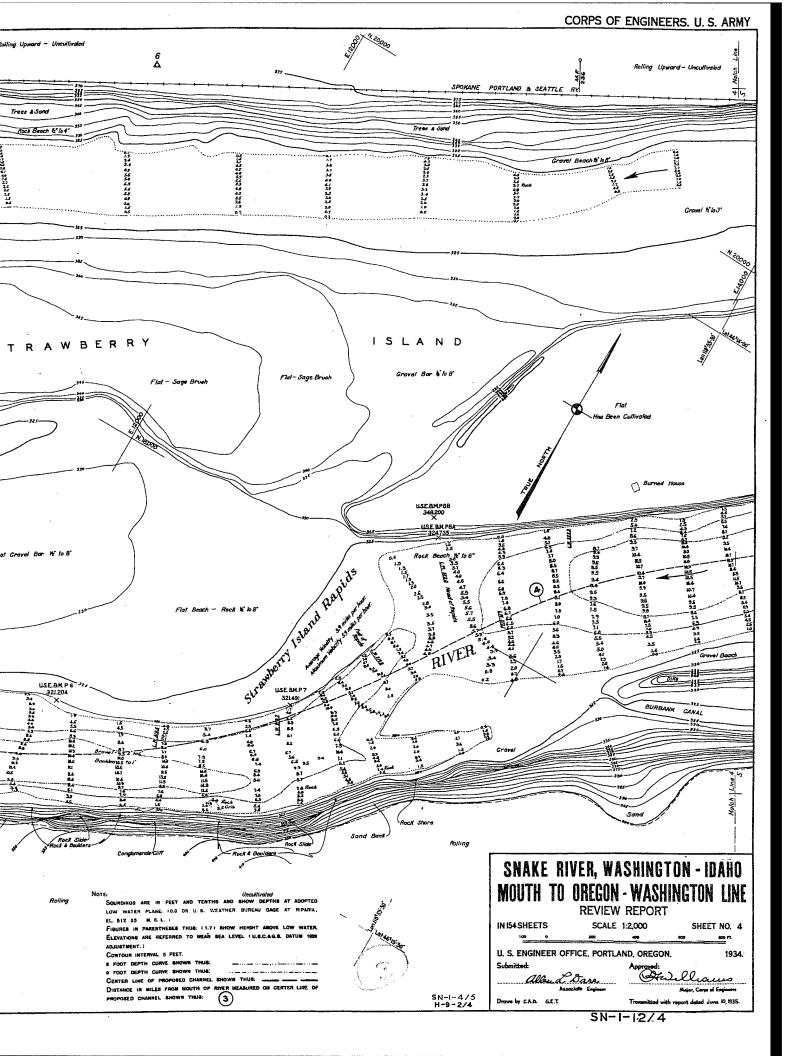


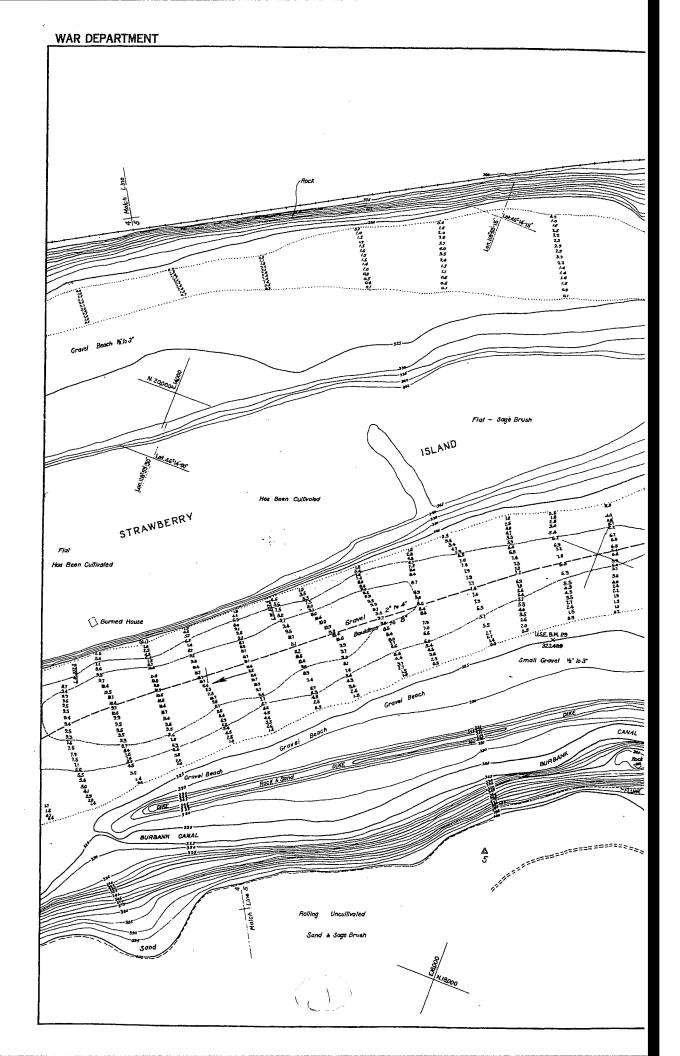


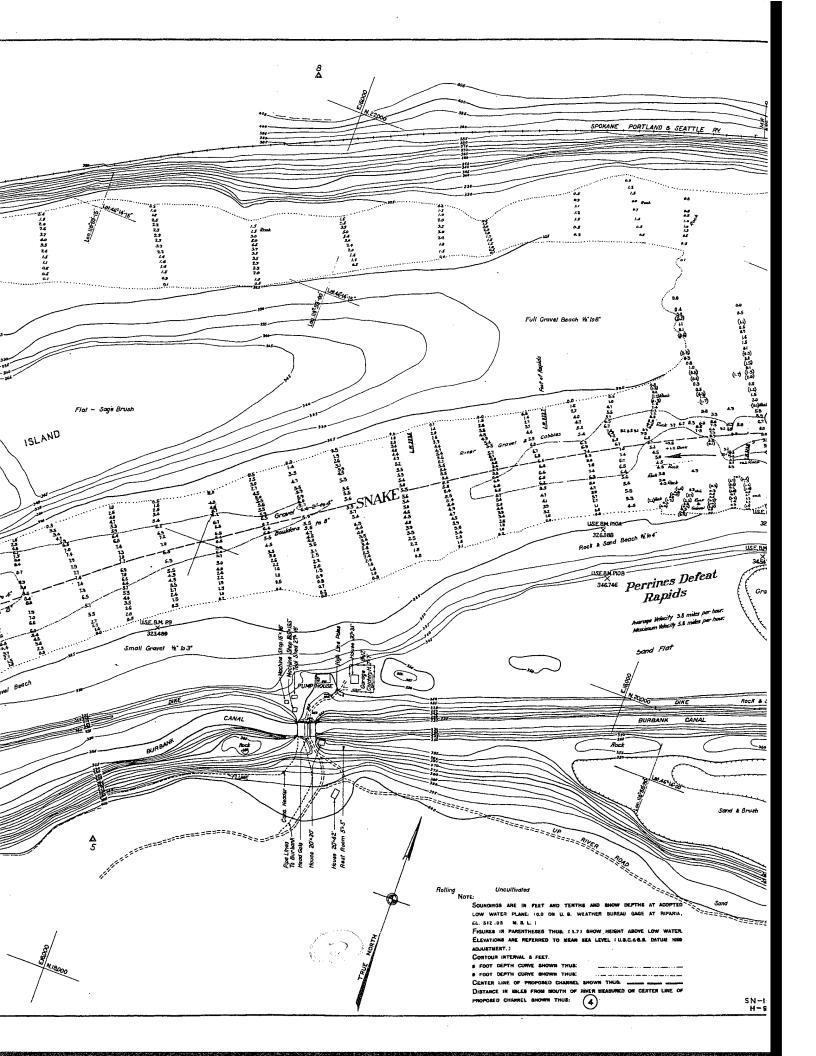


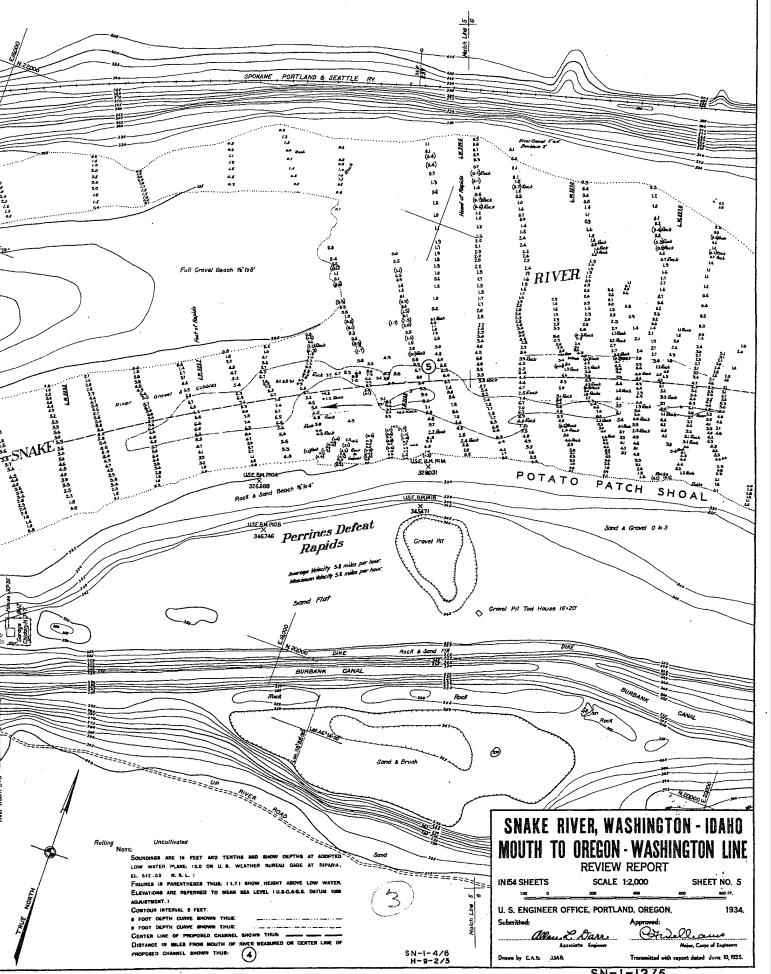


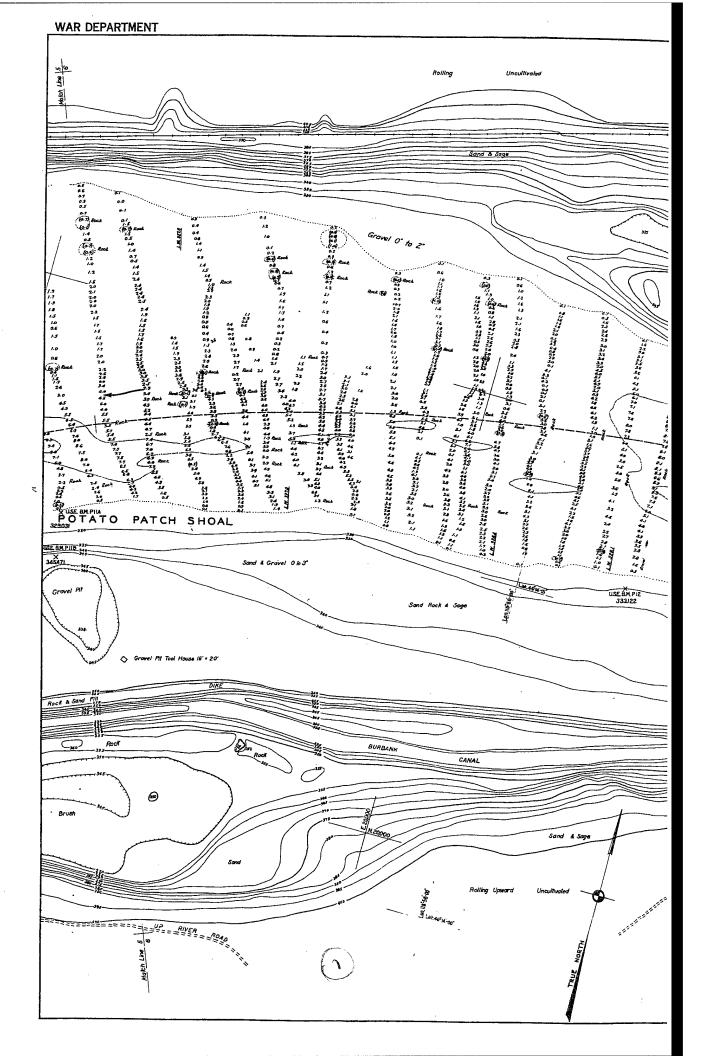


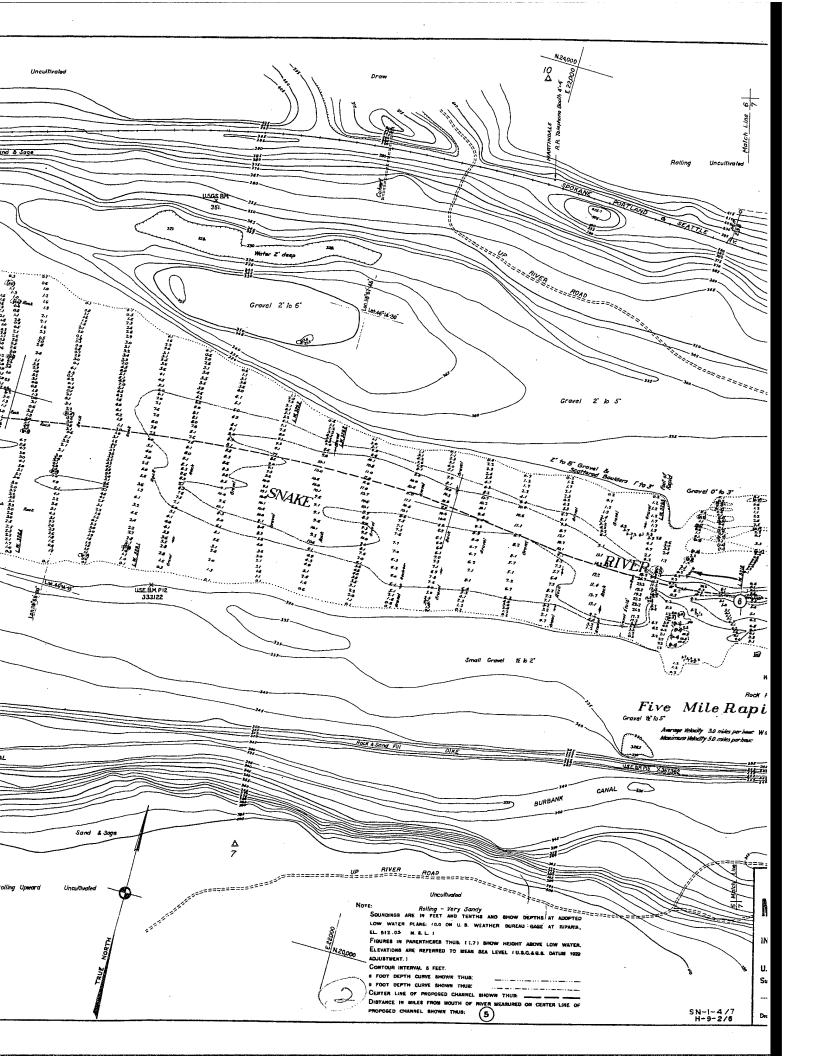


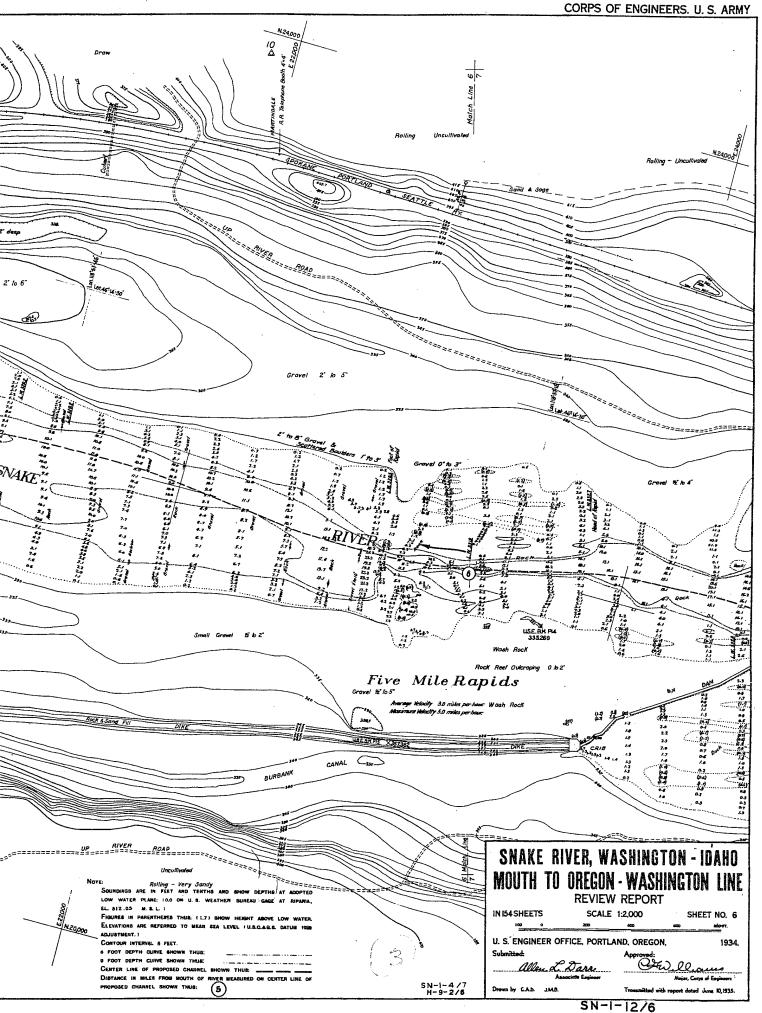


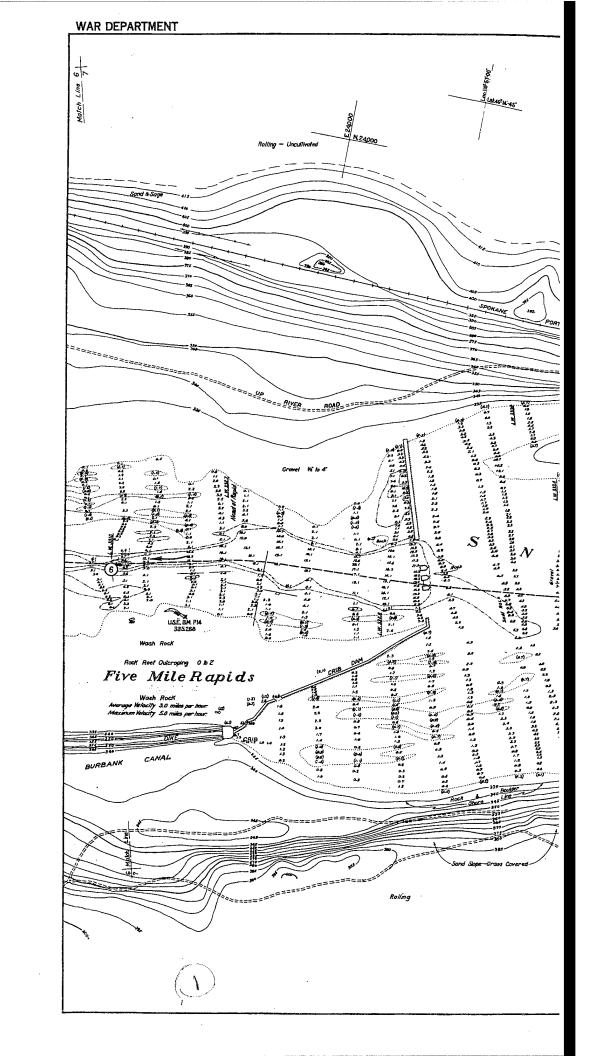




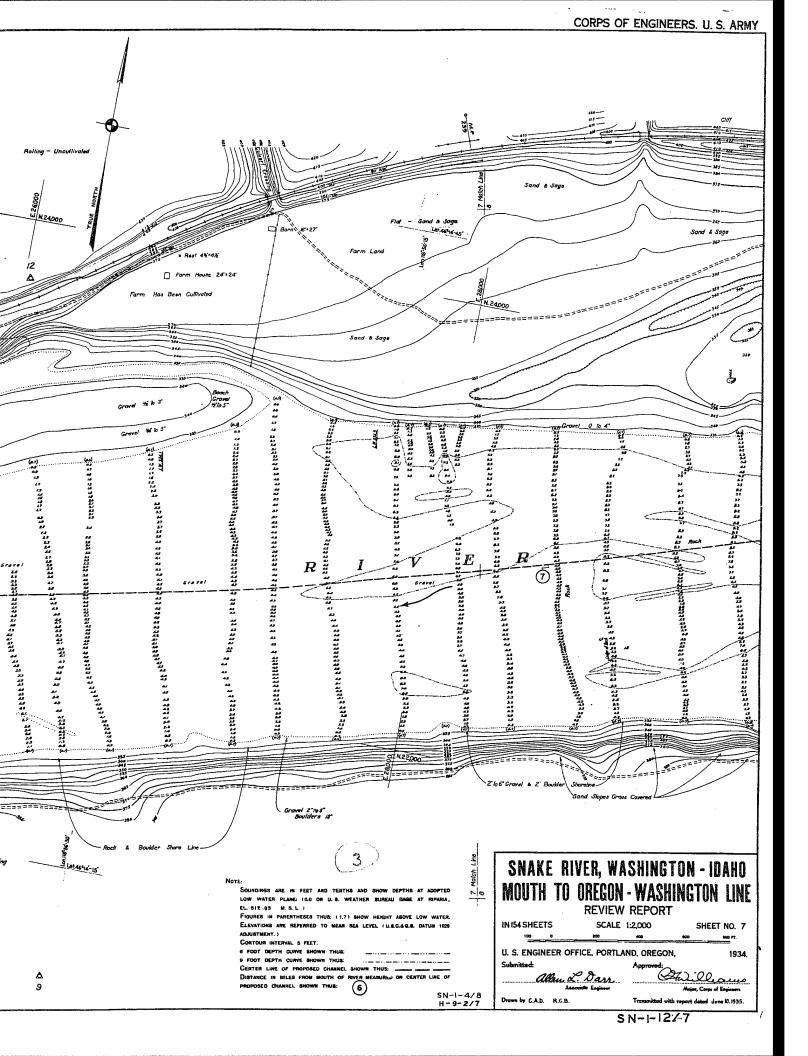


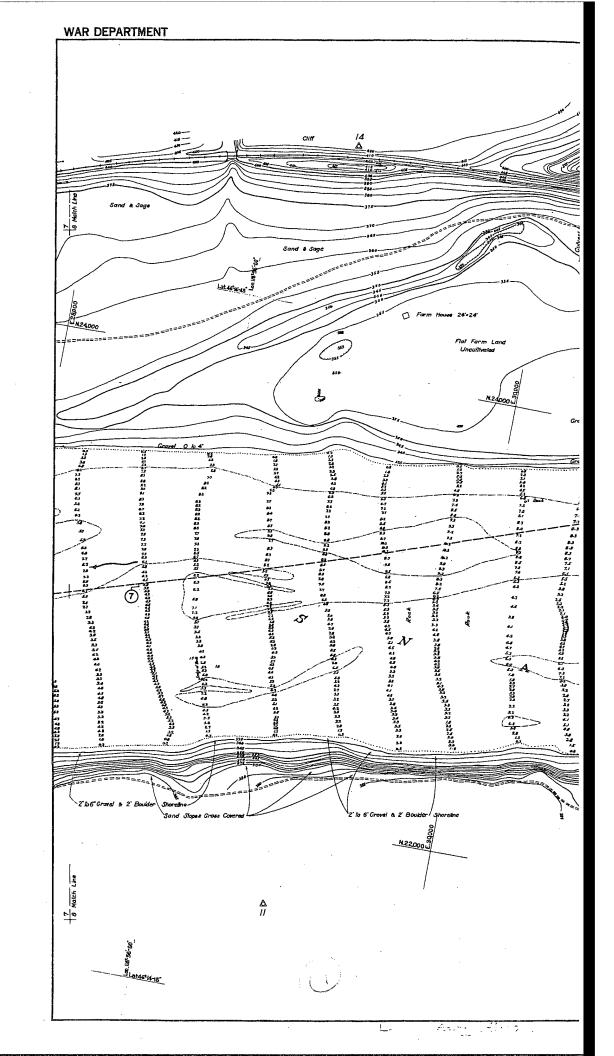


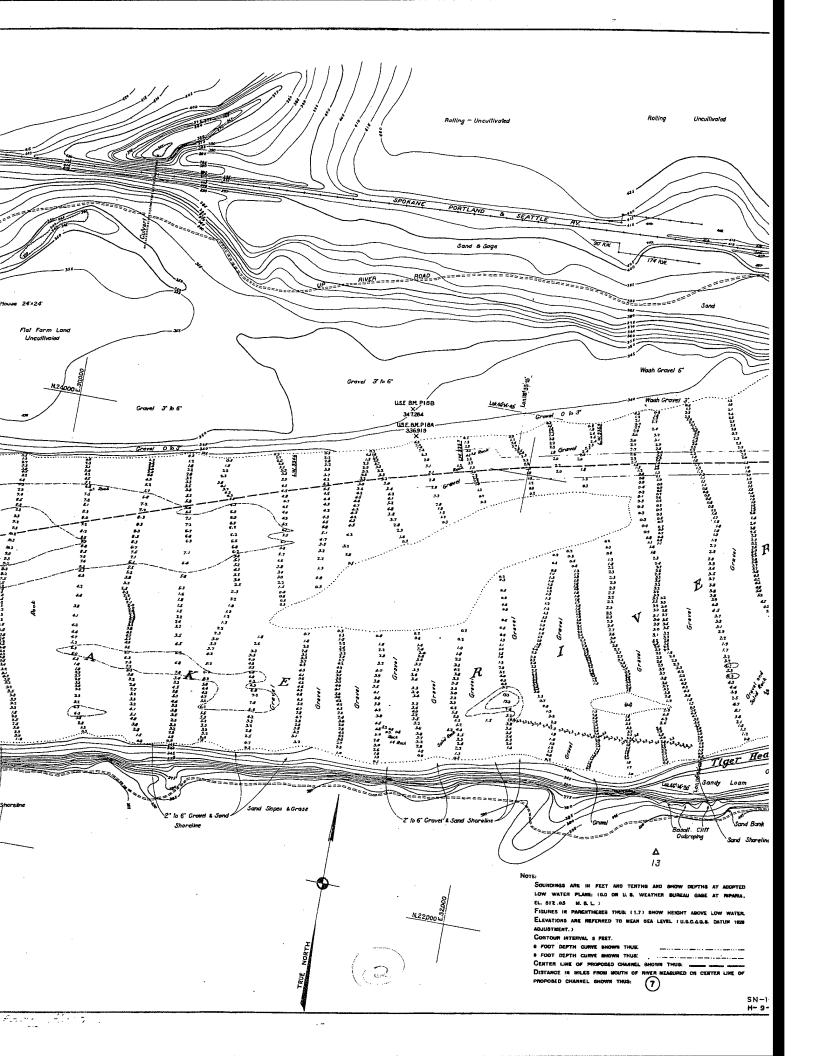


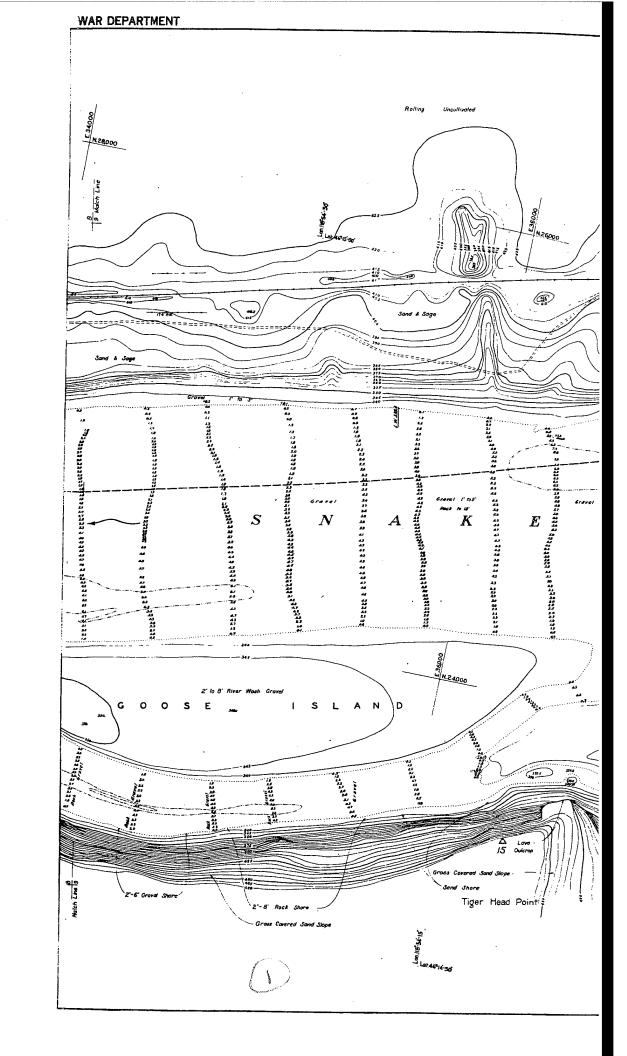


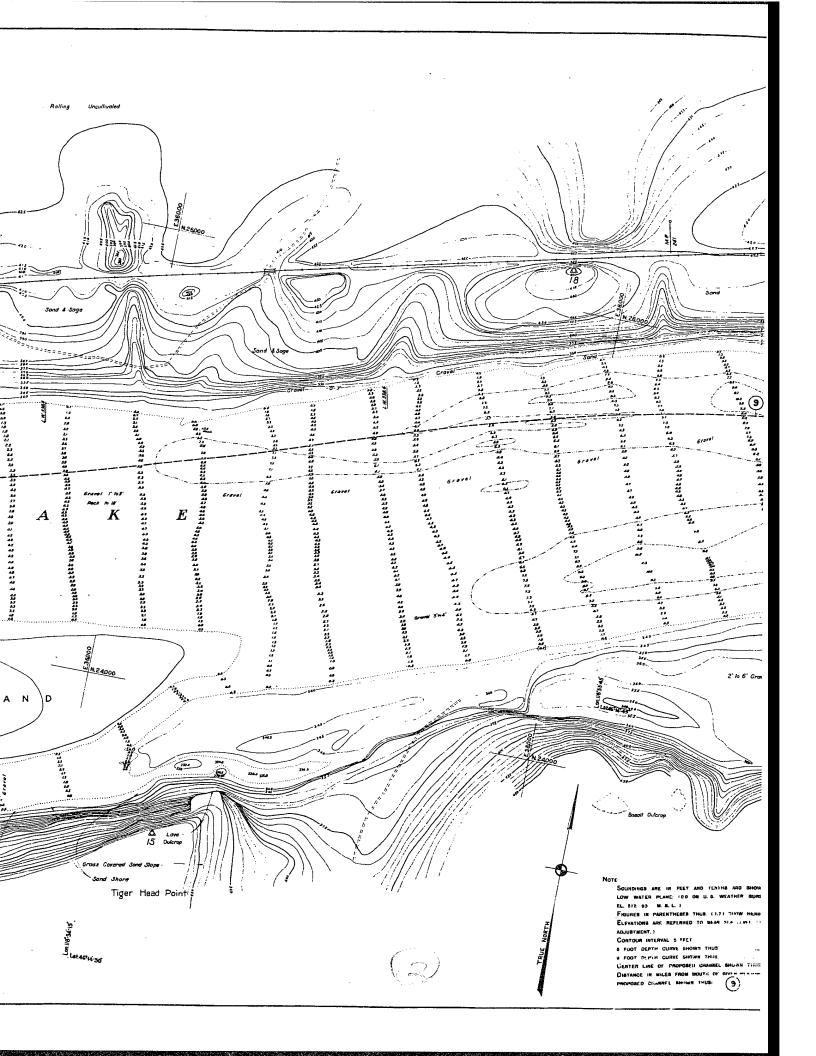


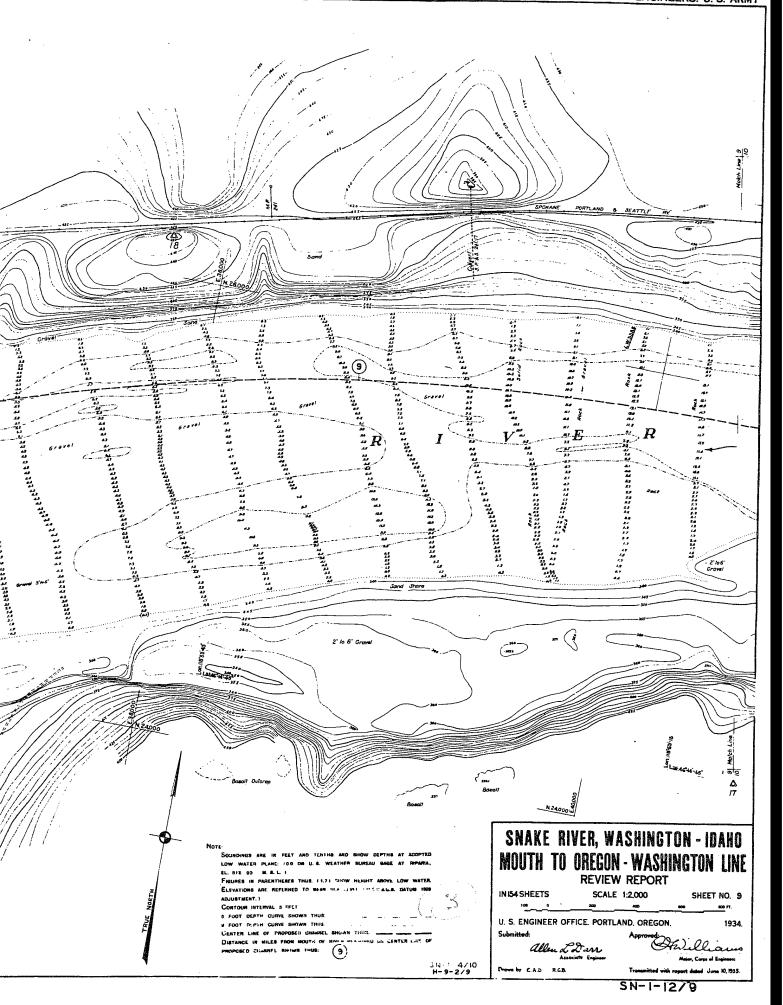


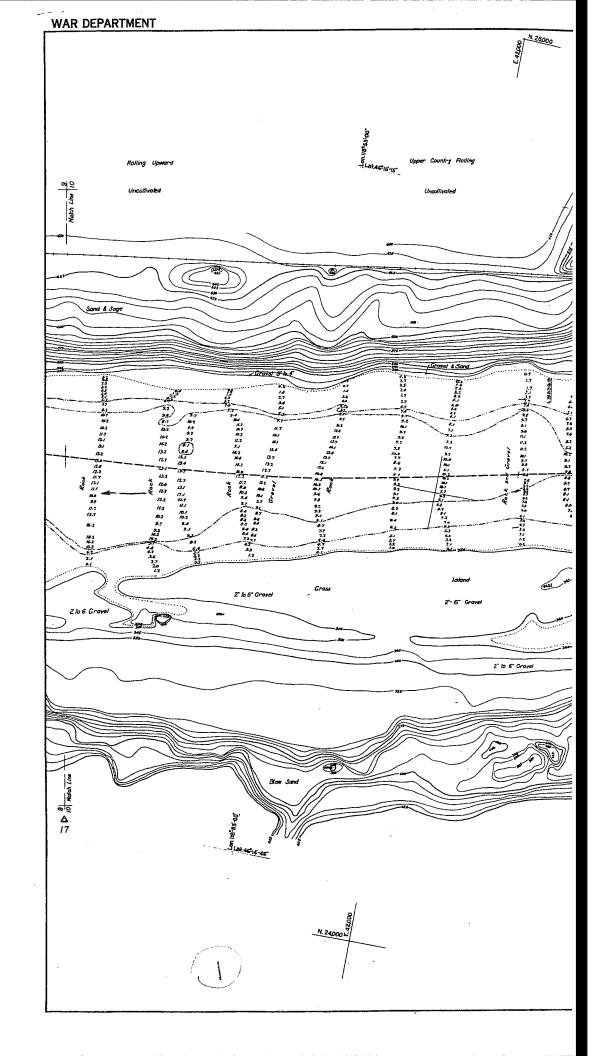


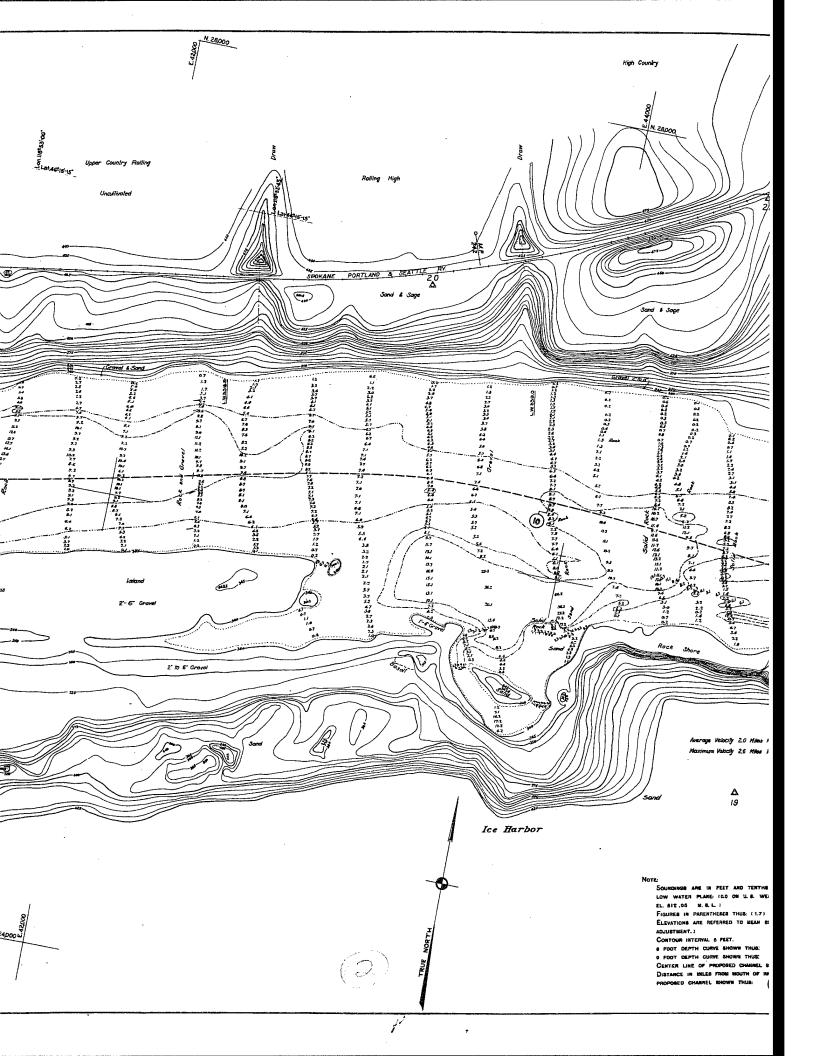


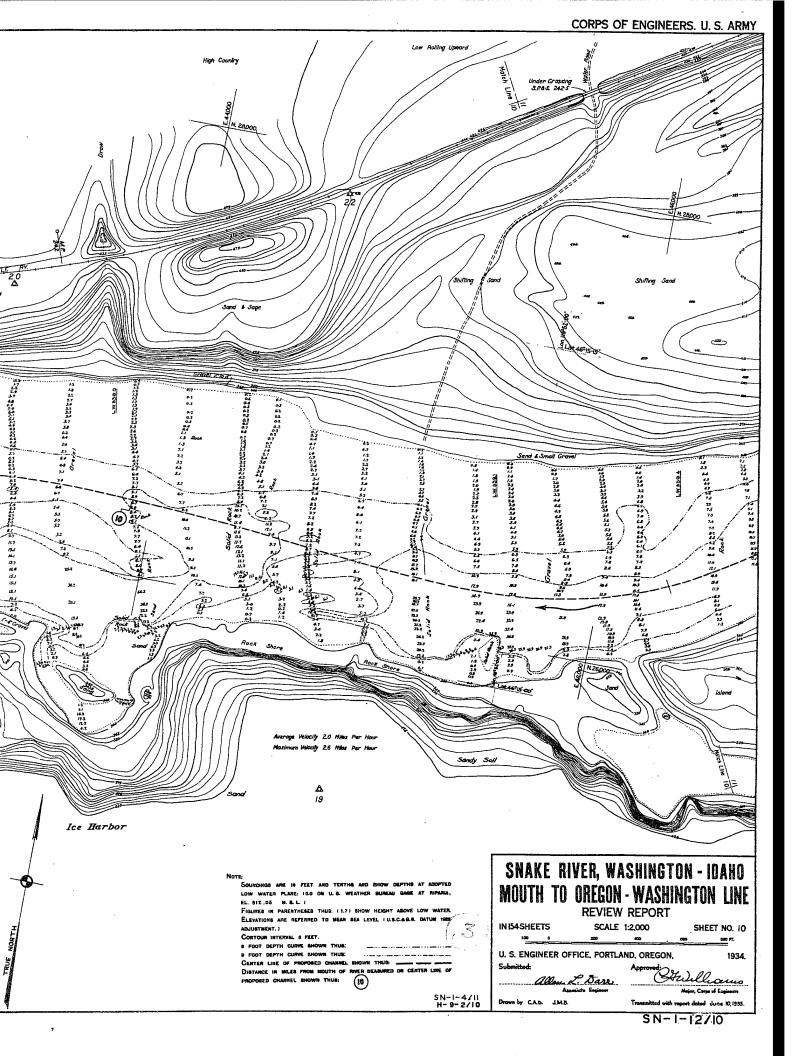


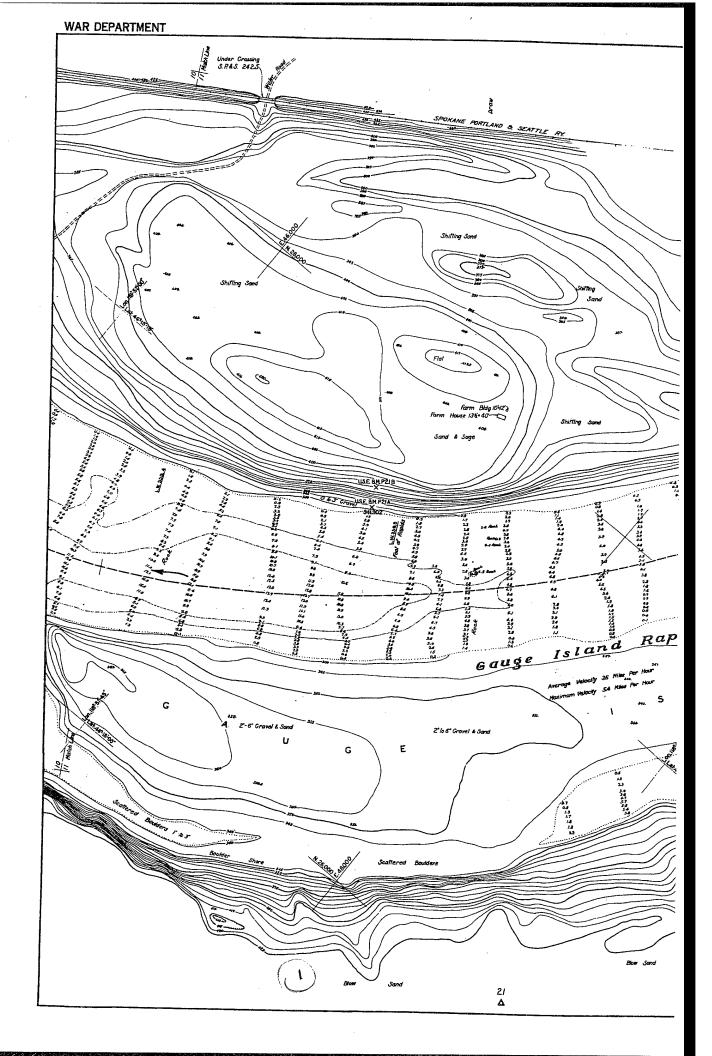


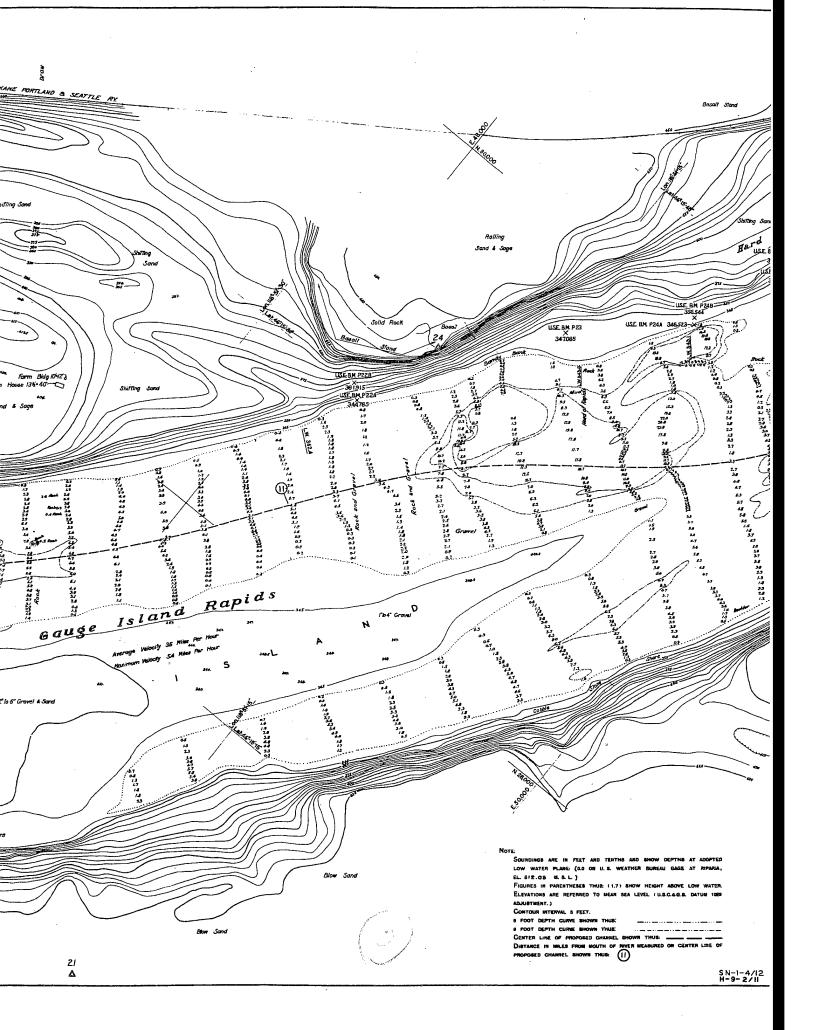




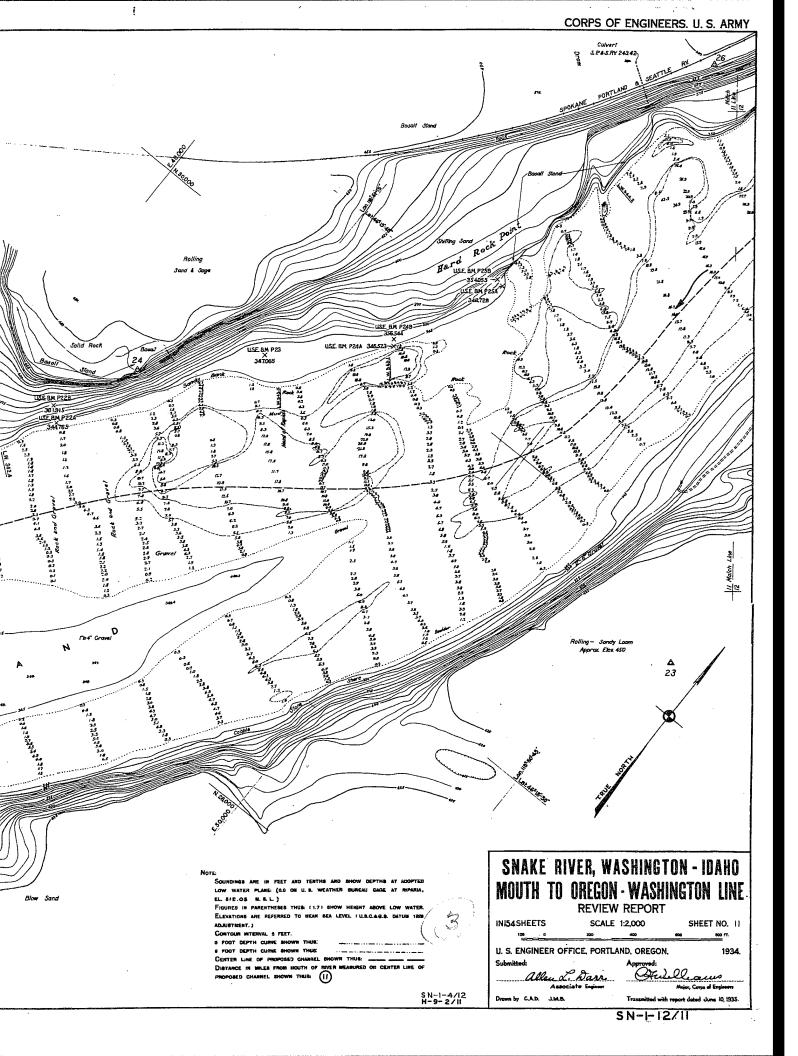


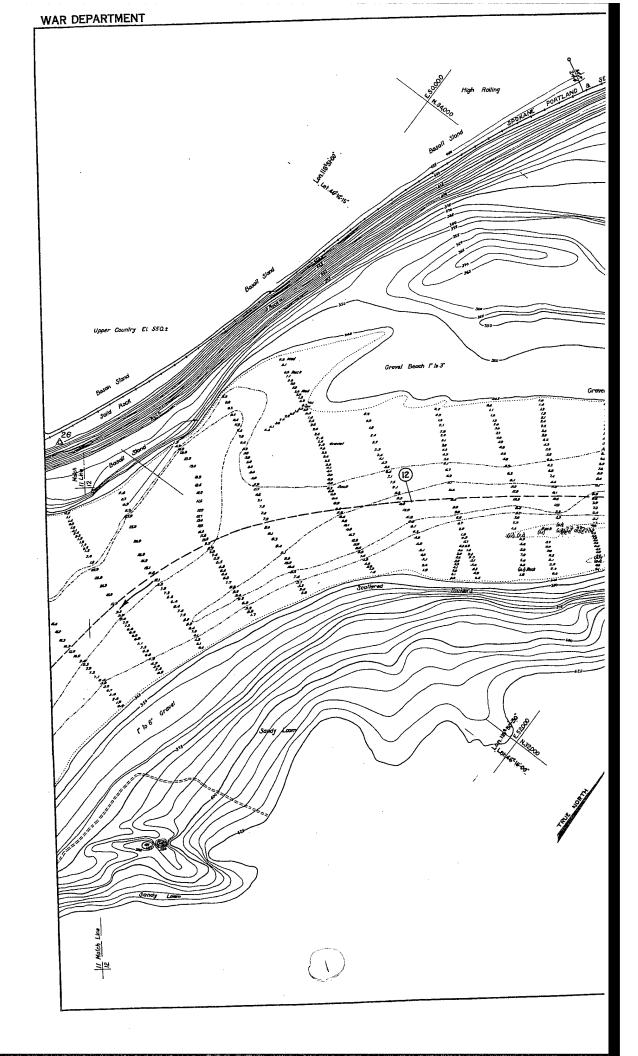


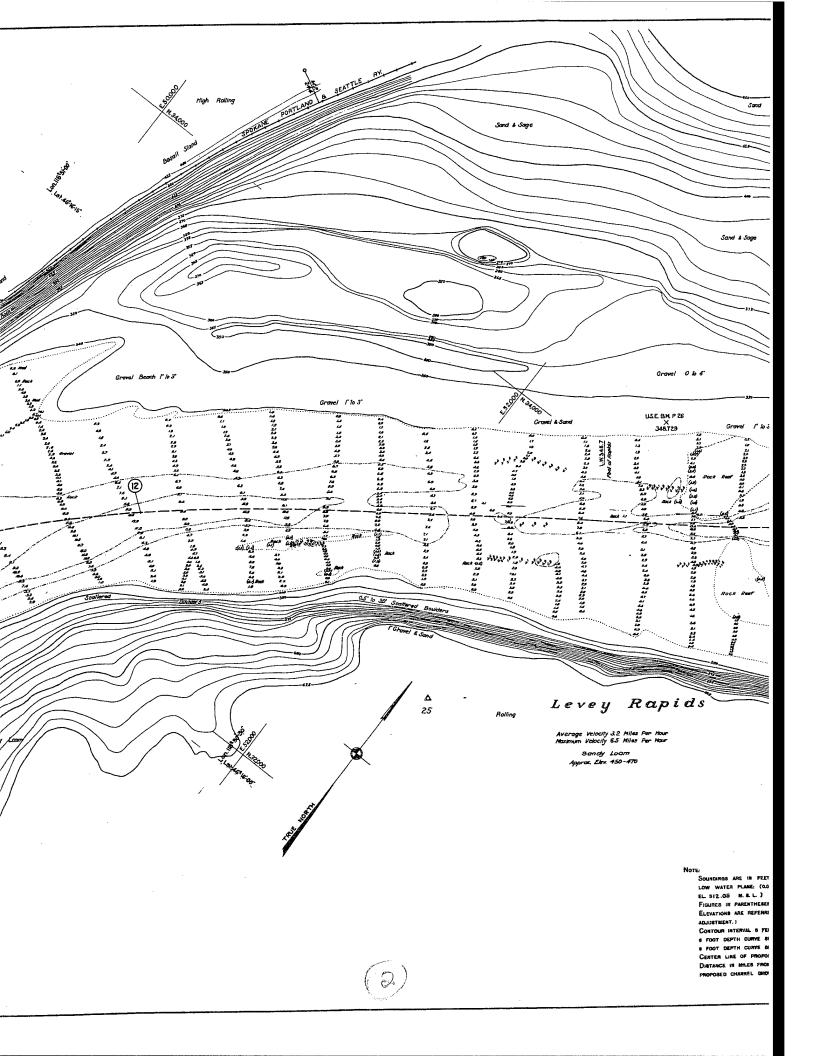


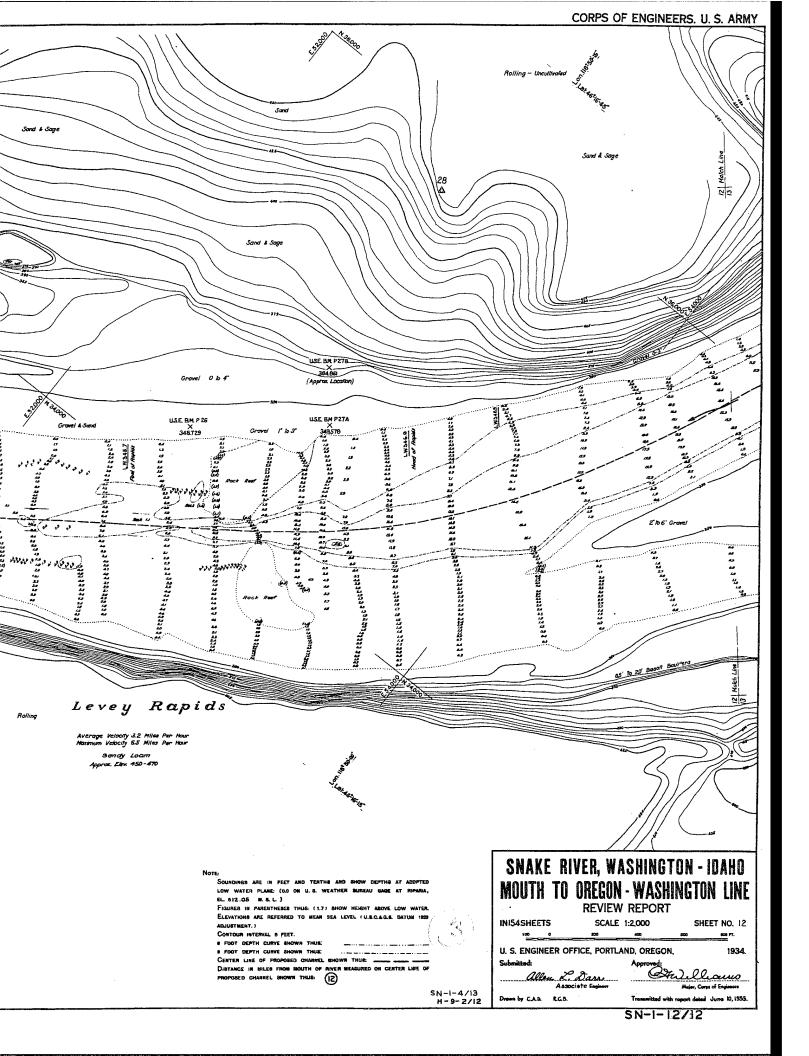


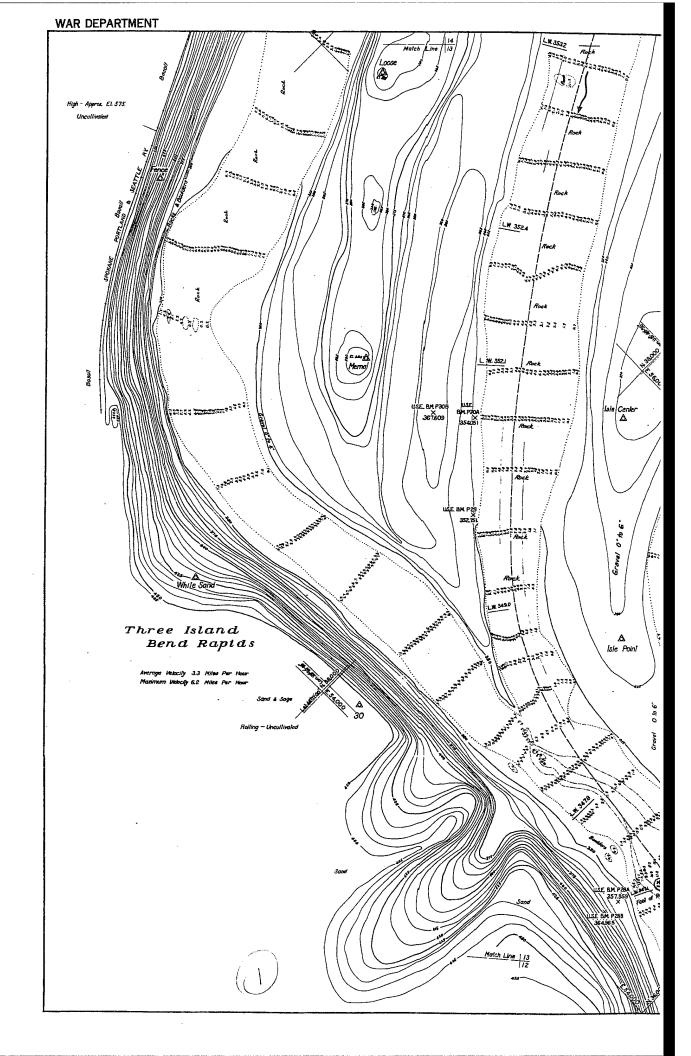
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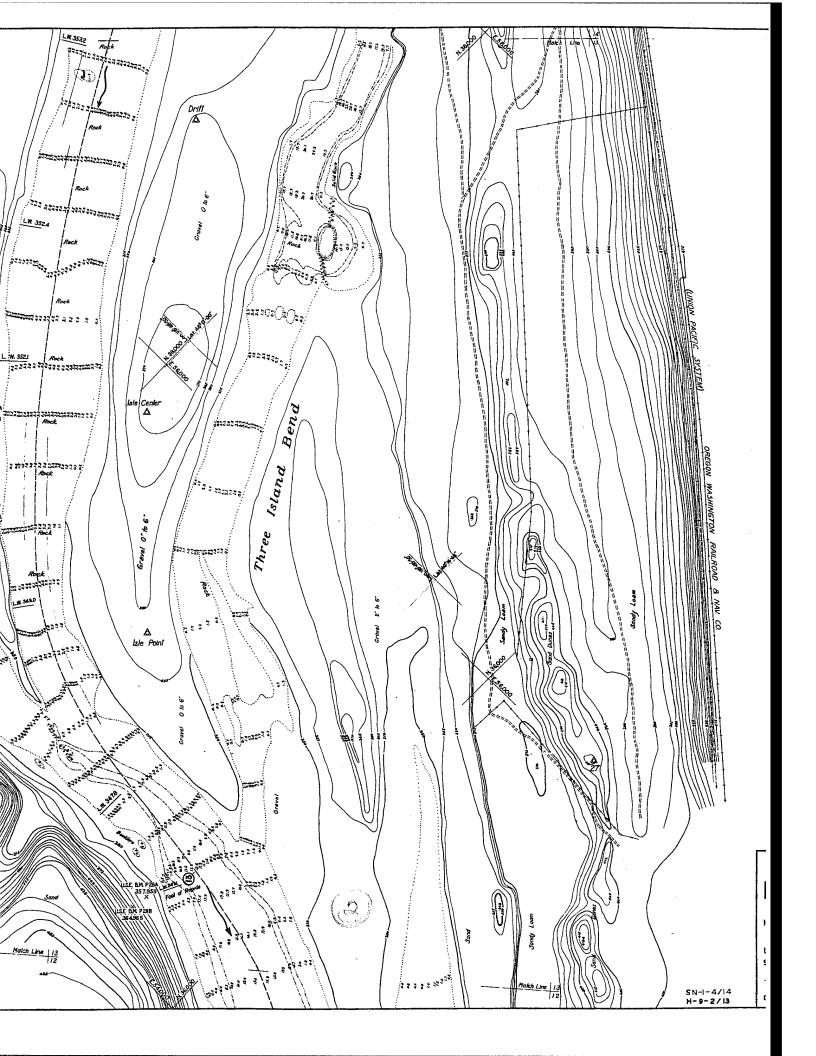


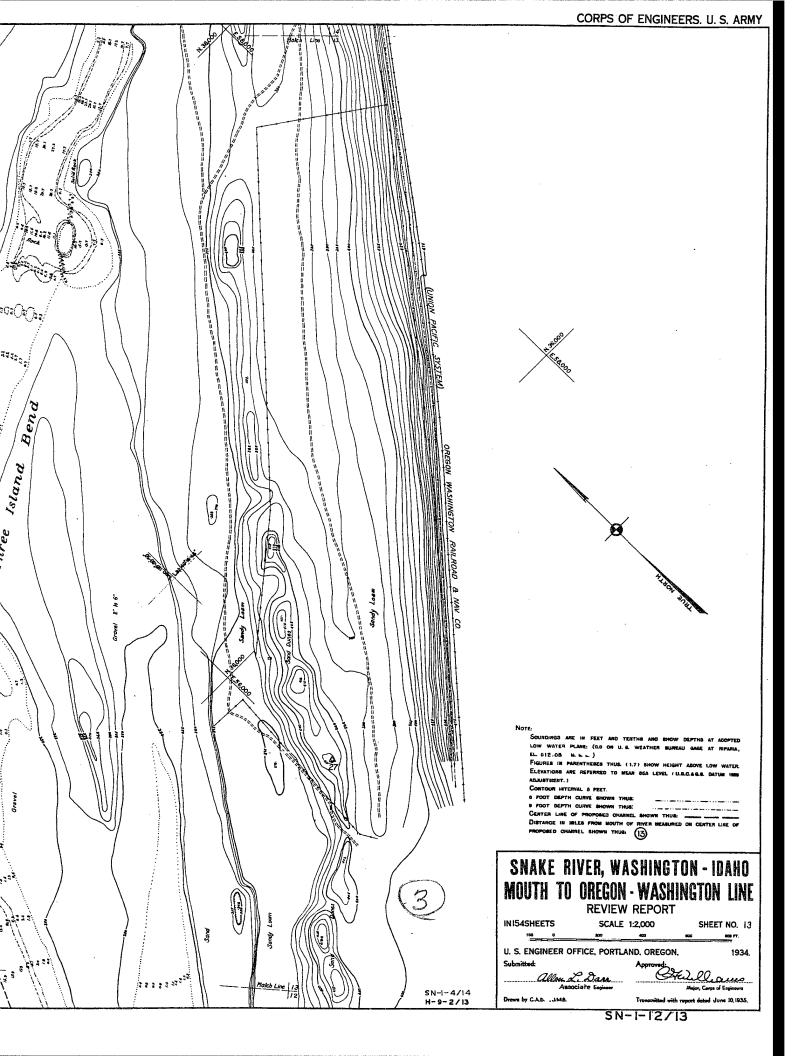


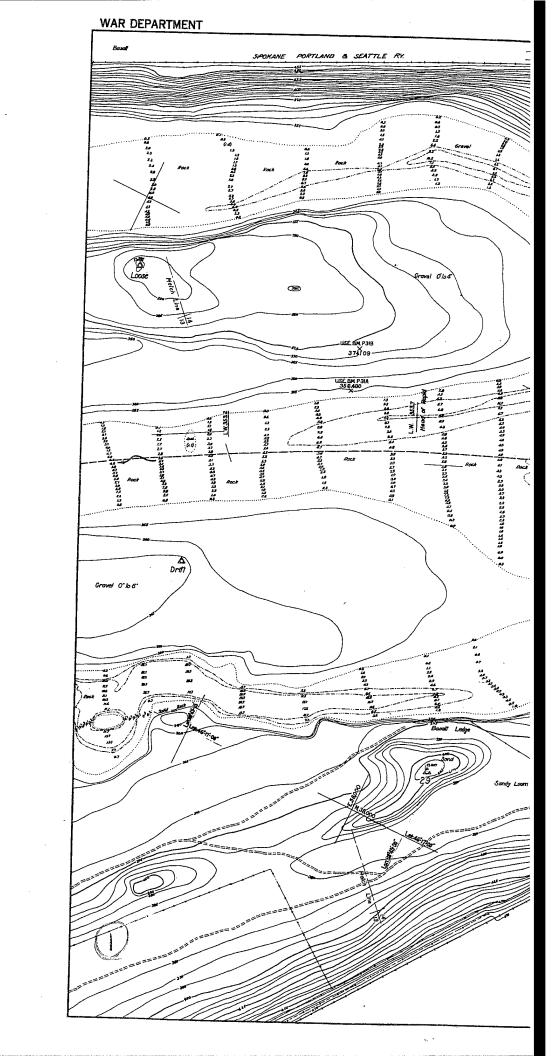


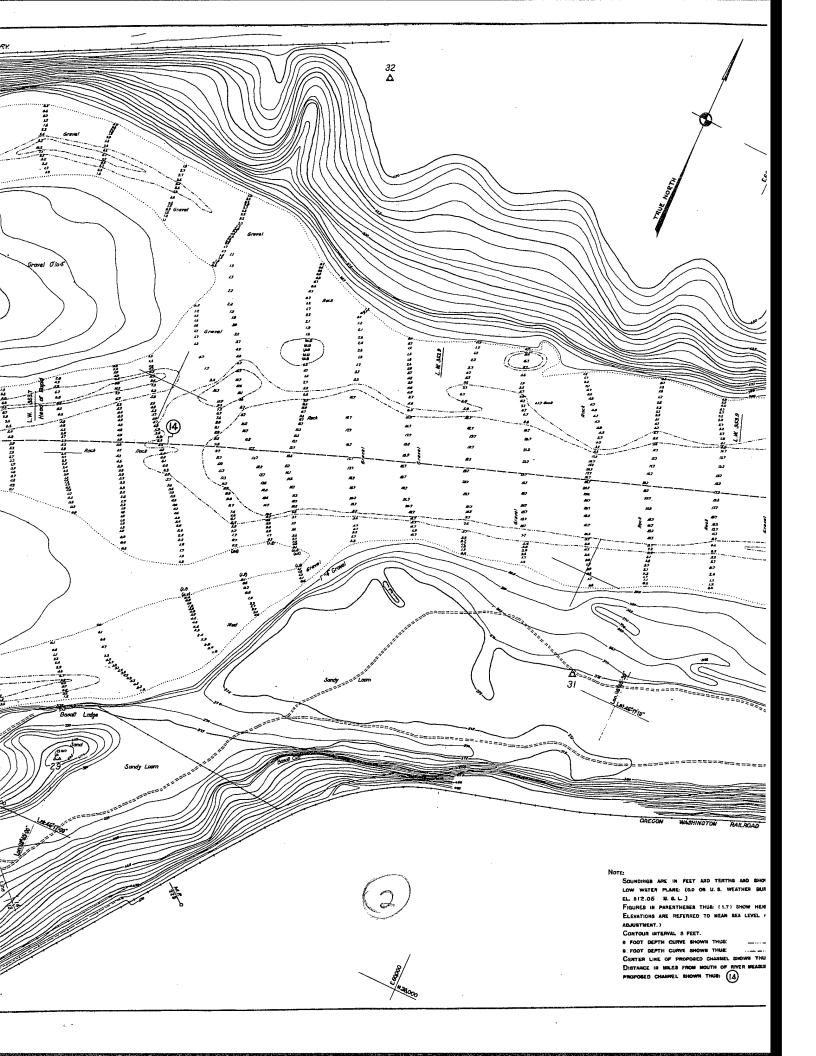


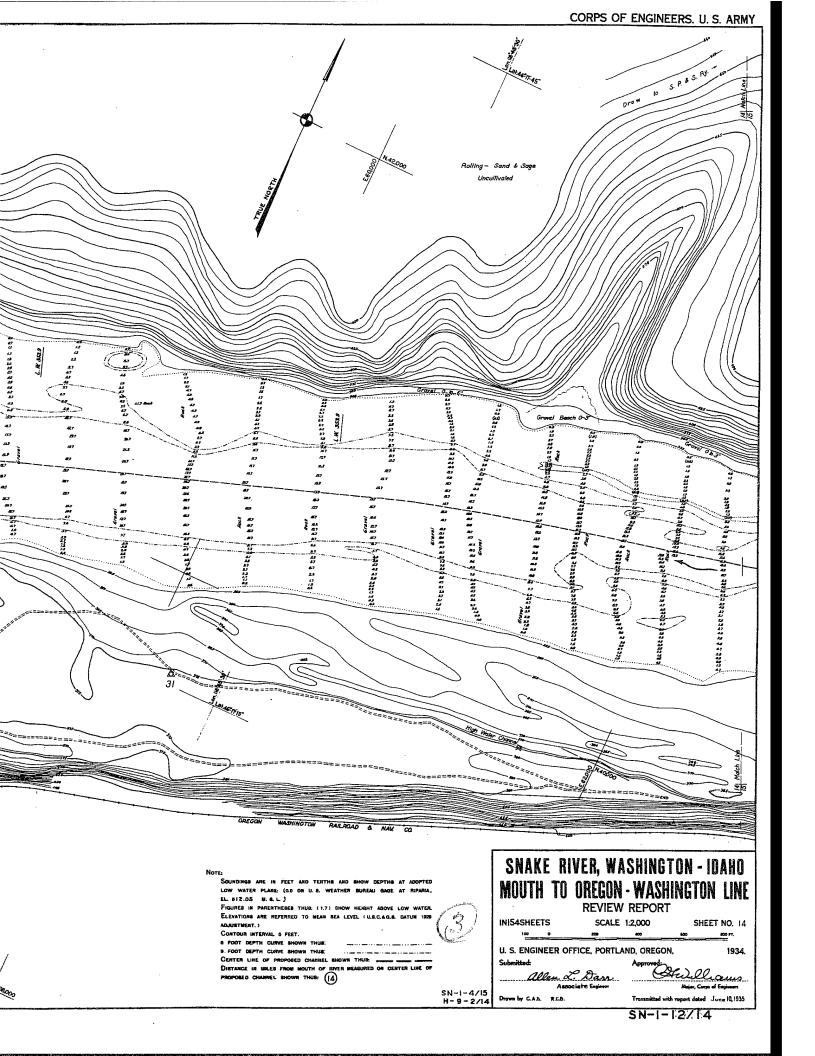


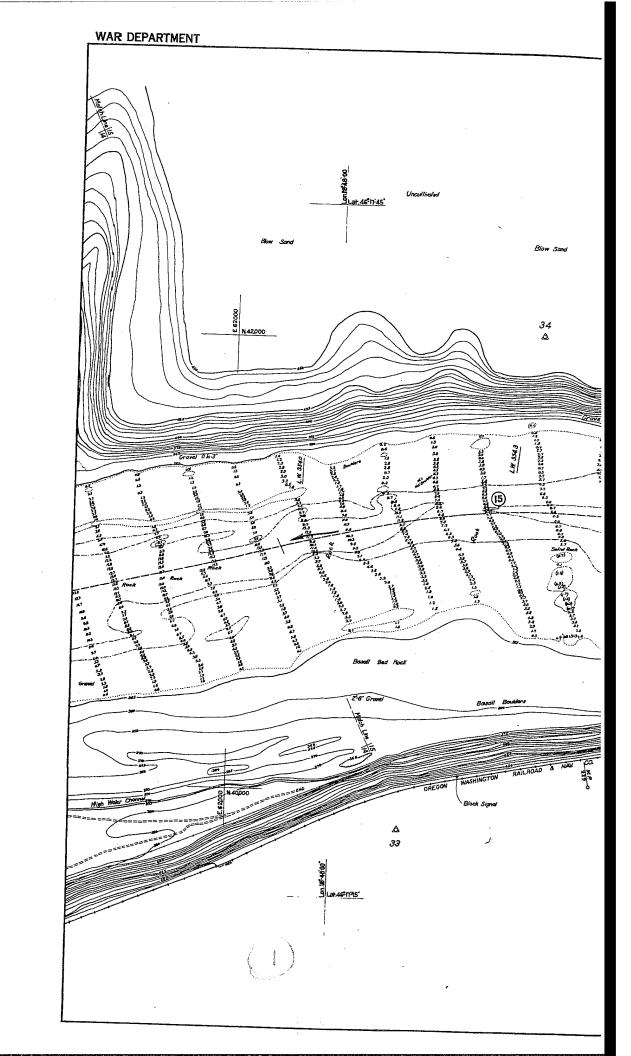




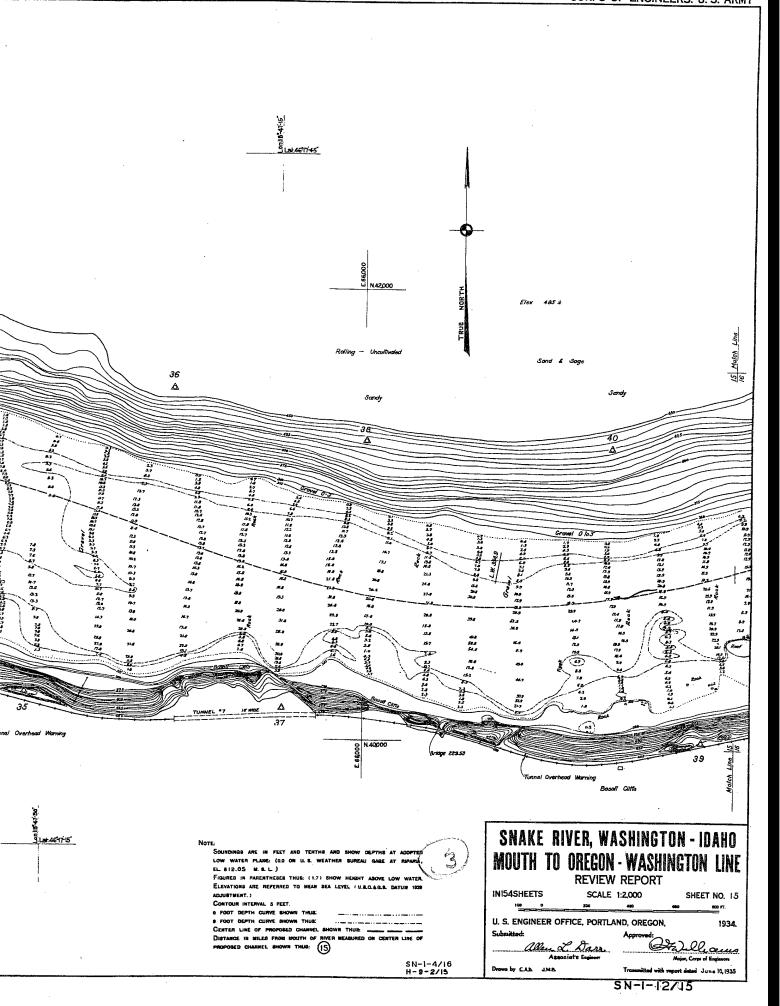


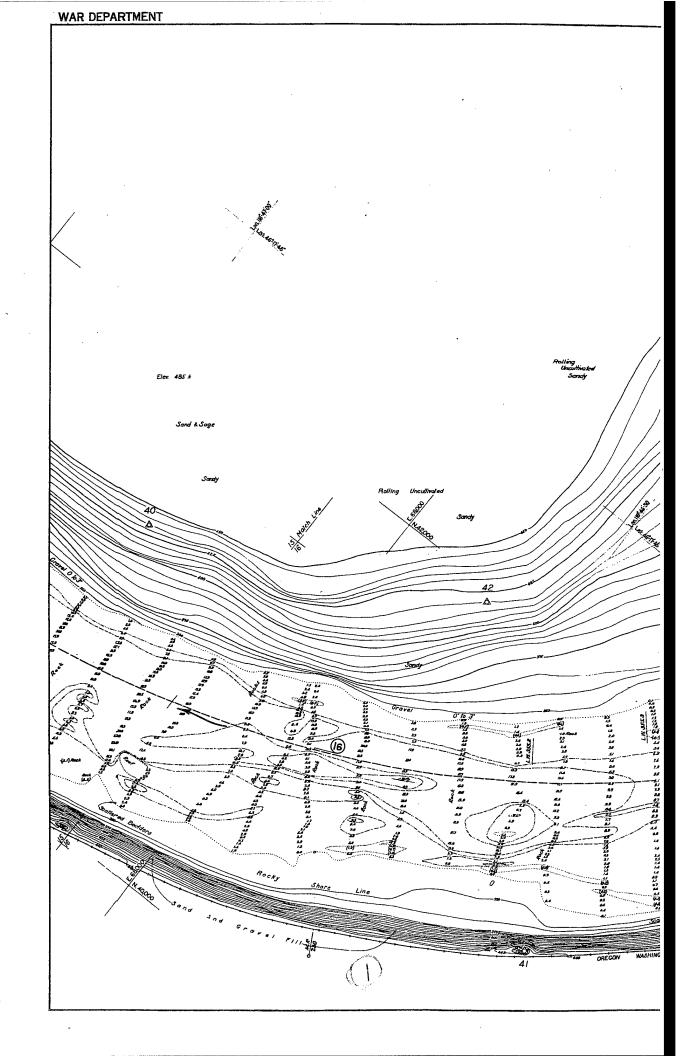


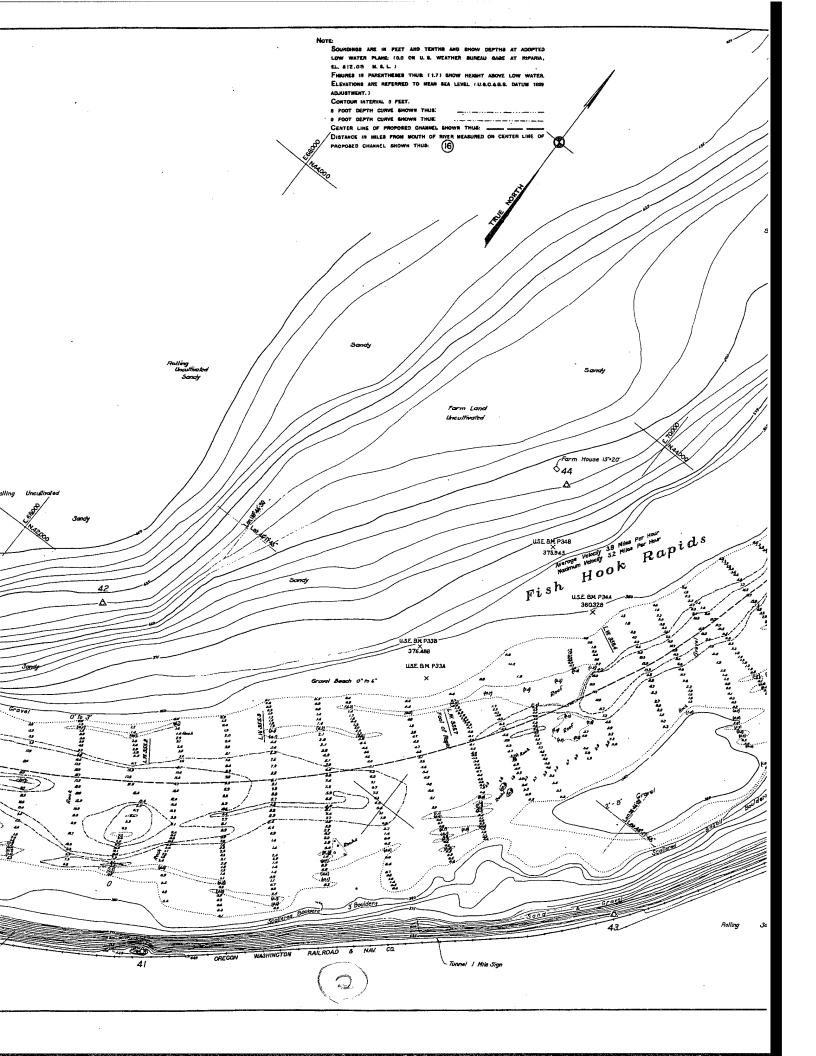


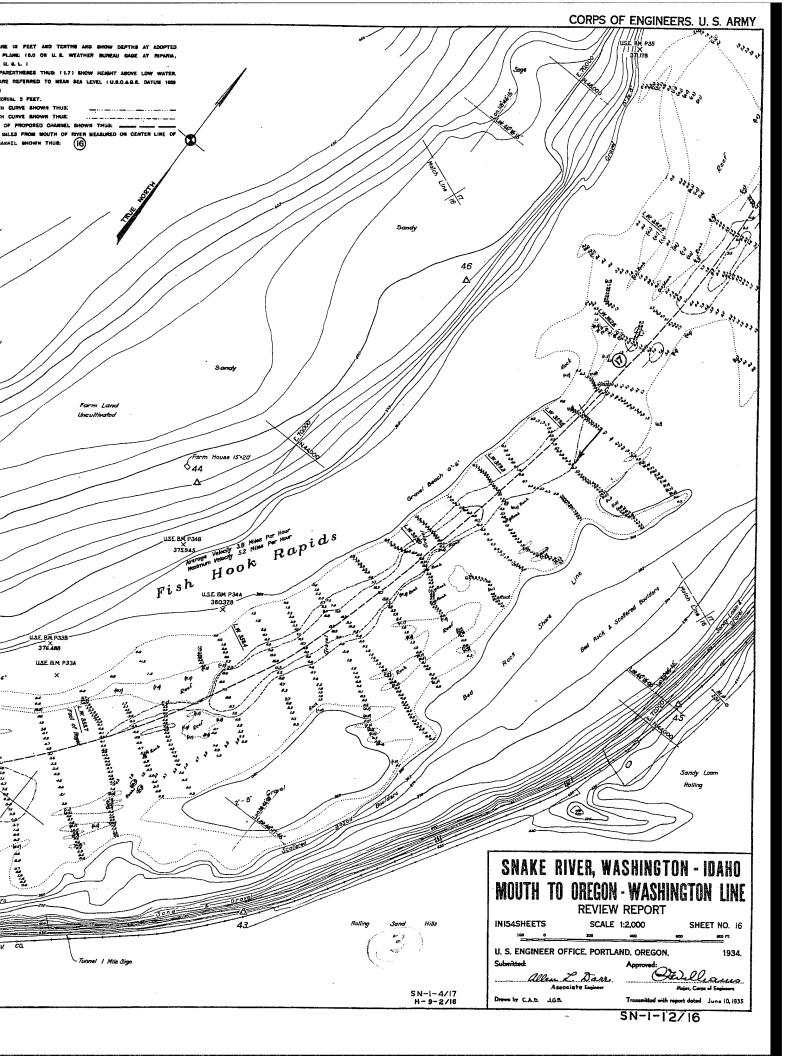


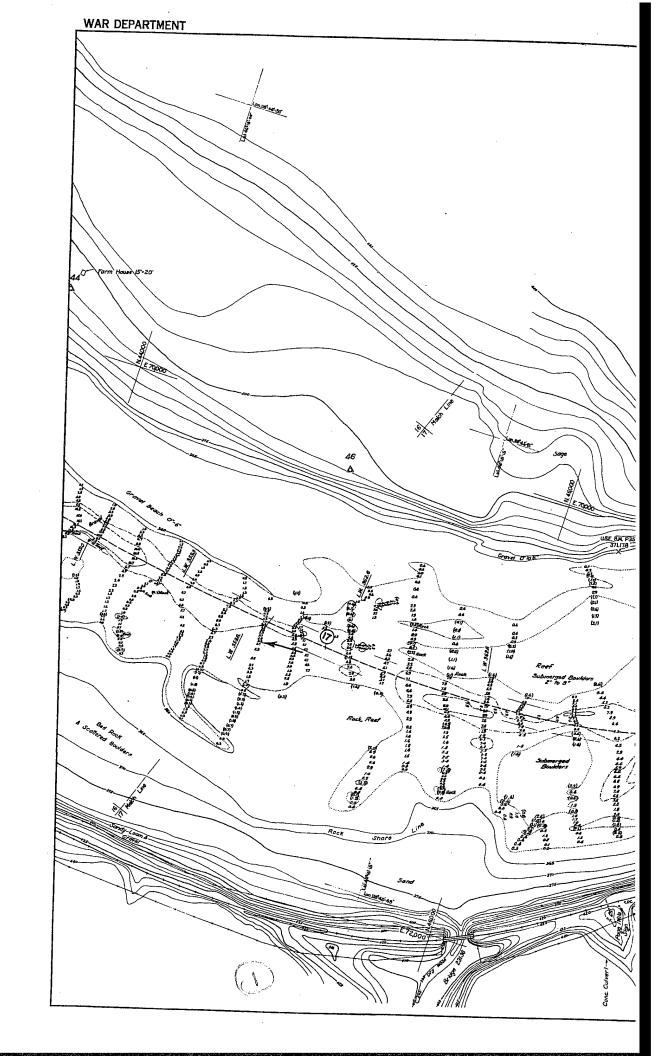
S Lai 45 17 45 F 45000 E.66000 34 Δ 36 0 N.400 Δ 33 COM WATER PLANE: (0.0 ON U. S. WEATHER BUREAU GA EL 812.05 M. S. L.) FIGURES IN PARENTHEESS THUS: (1.7) SHOW HEIGHT AND ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL (U.S.O.6) ELEVATIONAL ARE REFERRED TO MEAN
ADJUSTMENT.)
CONTOUR INTERVAL 8 FEET.
8 FOOT DEPTH CURVE BHOWN THUS:
CENTER LUSE OF PROPOSED CHARREL SHOWN THUS:
DISTANCE IN SILES FROM BOUTH OF RIVER MEASURED ON
PROPOSED CHARREL SHOWN THUS:

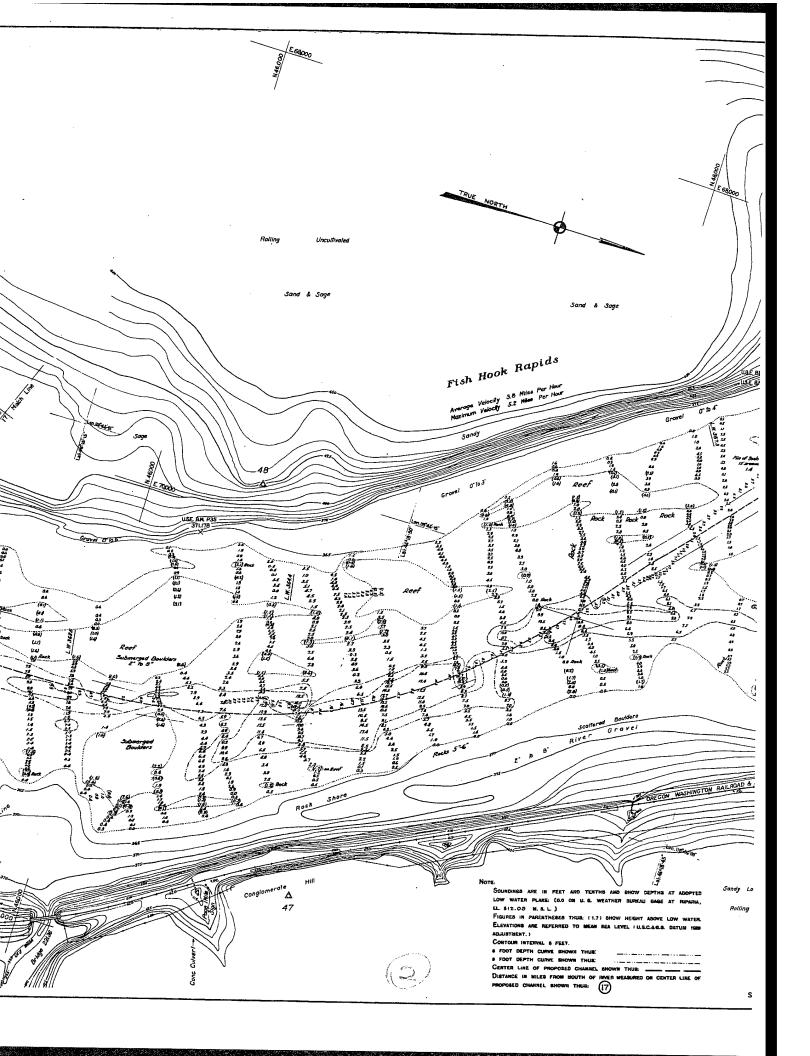






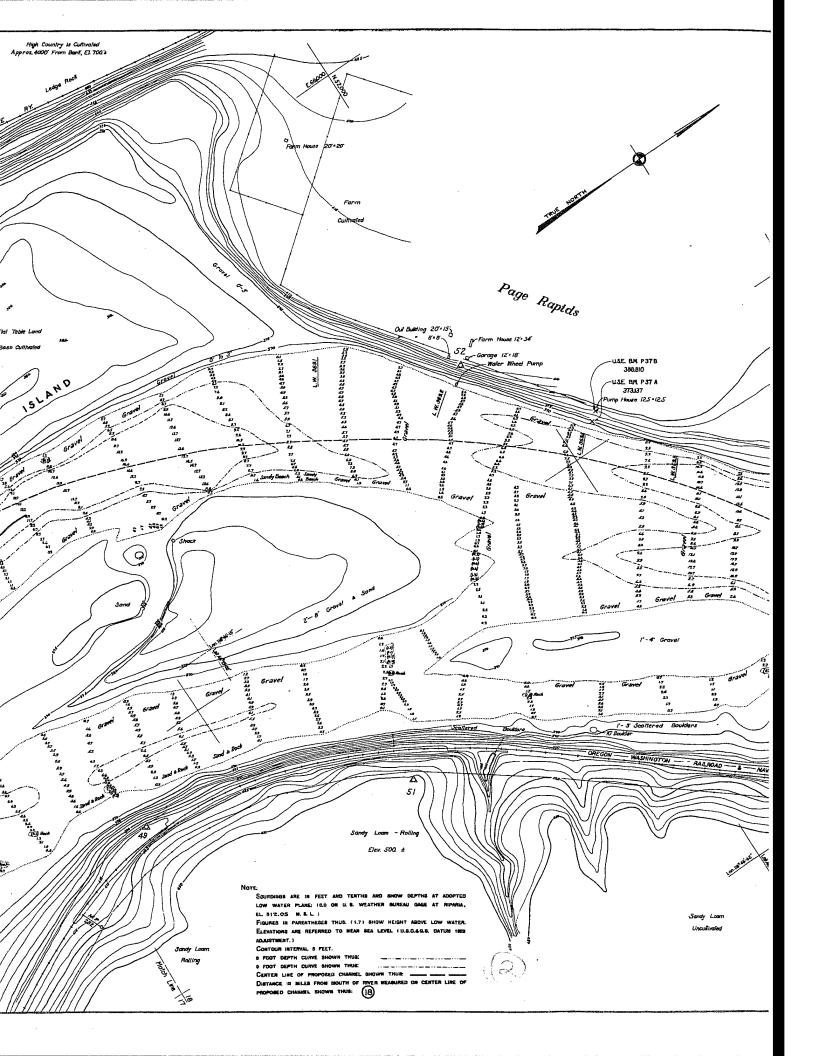


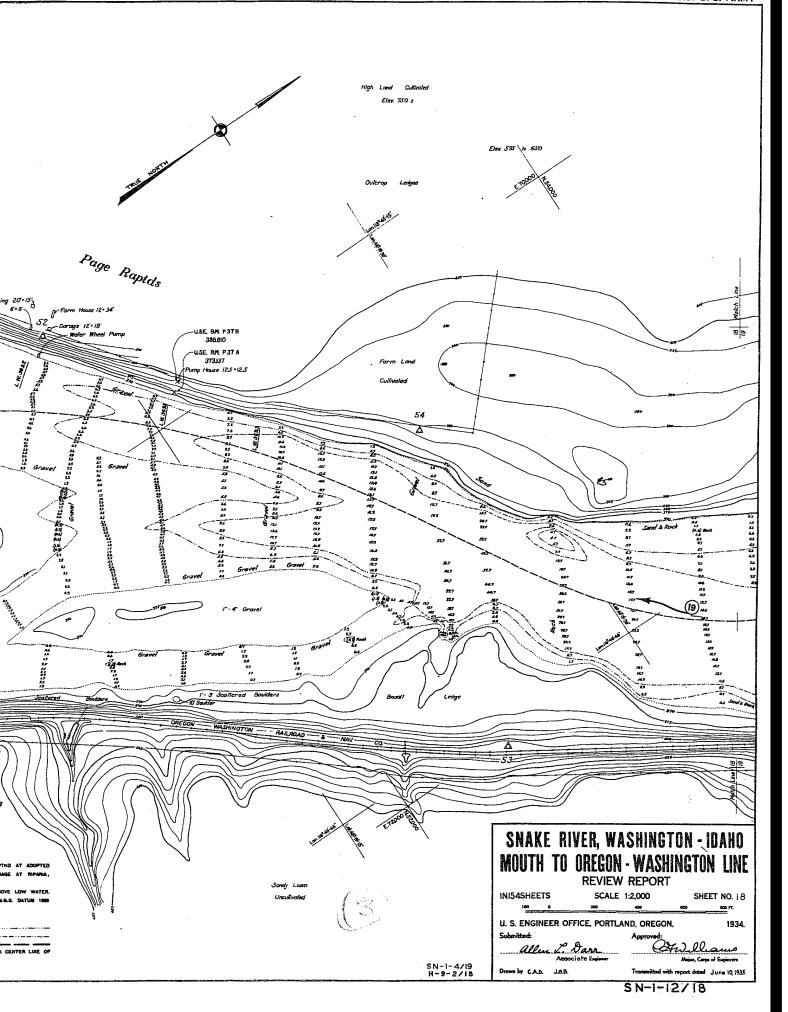


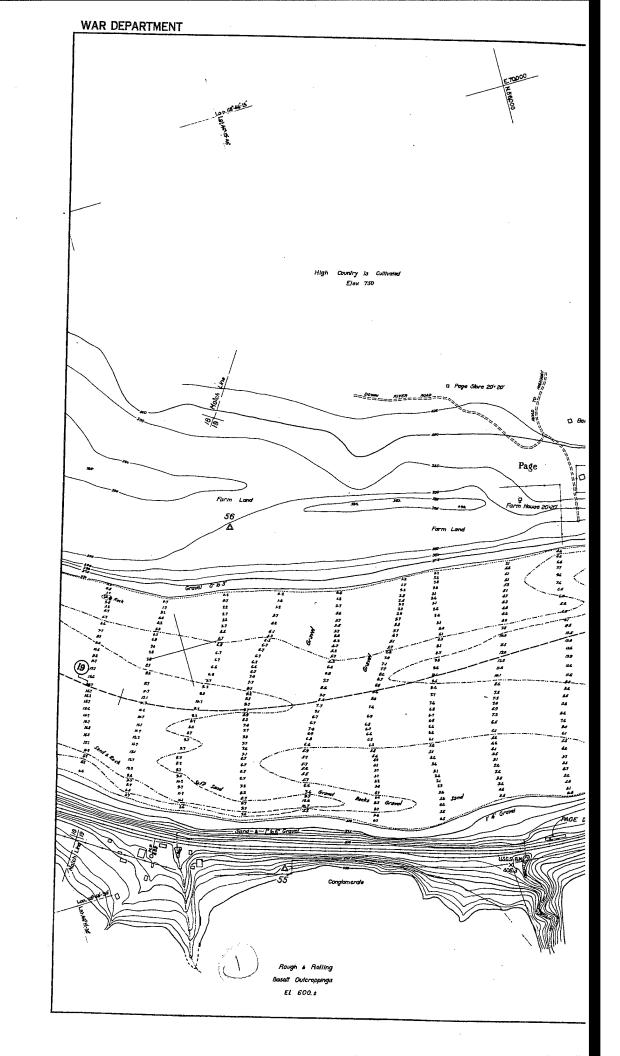


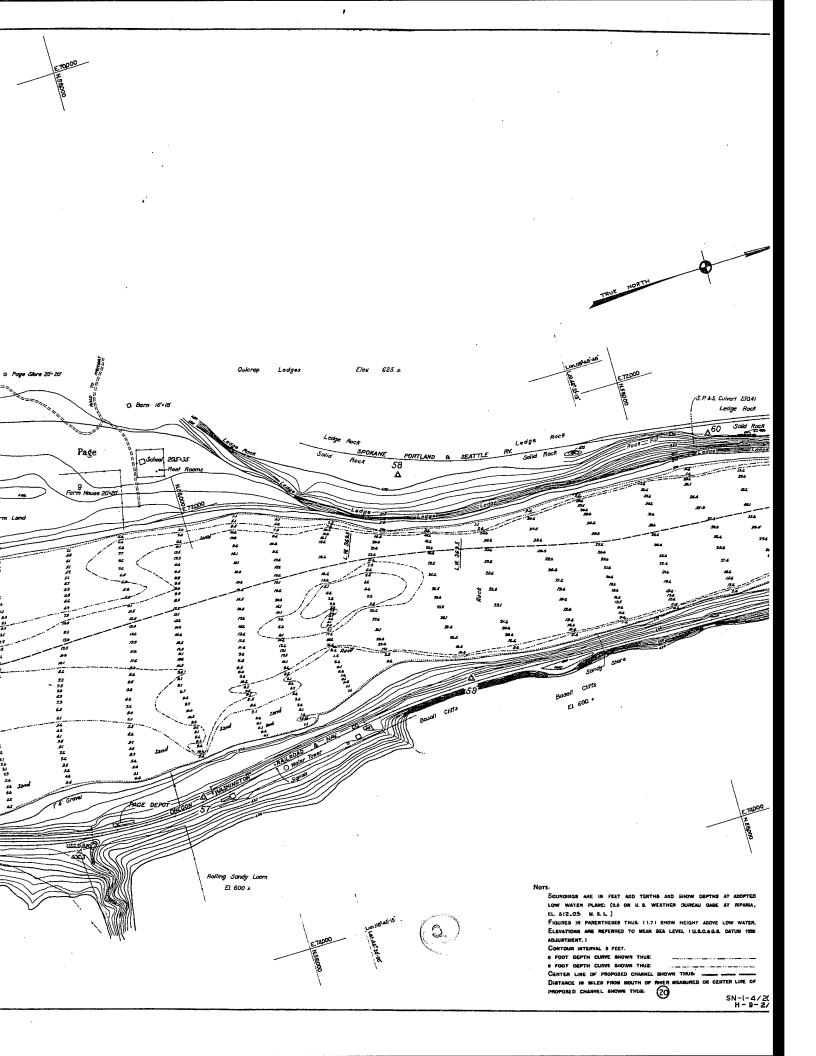
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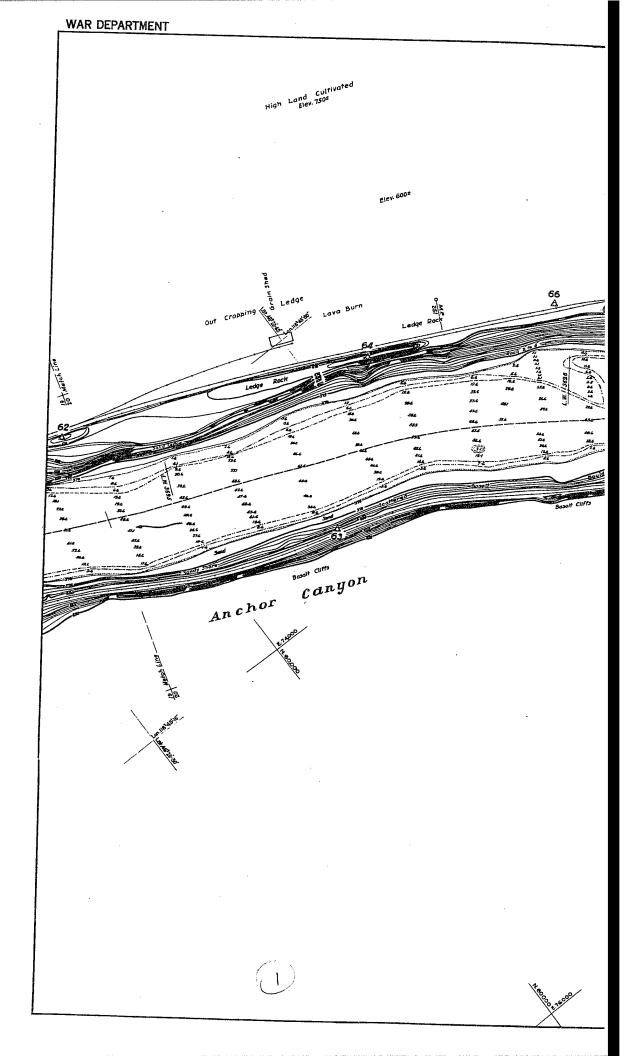


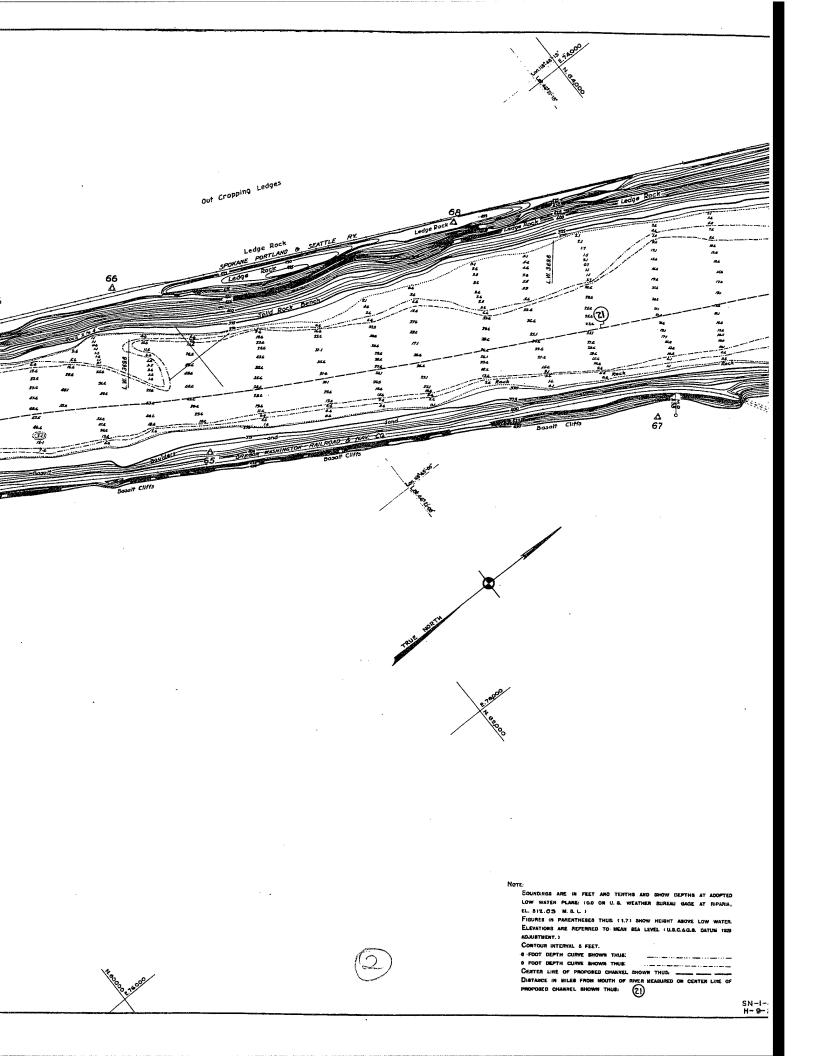


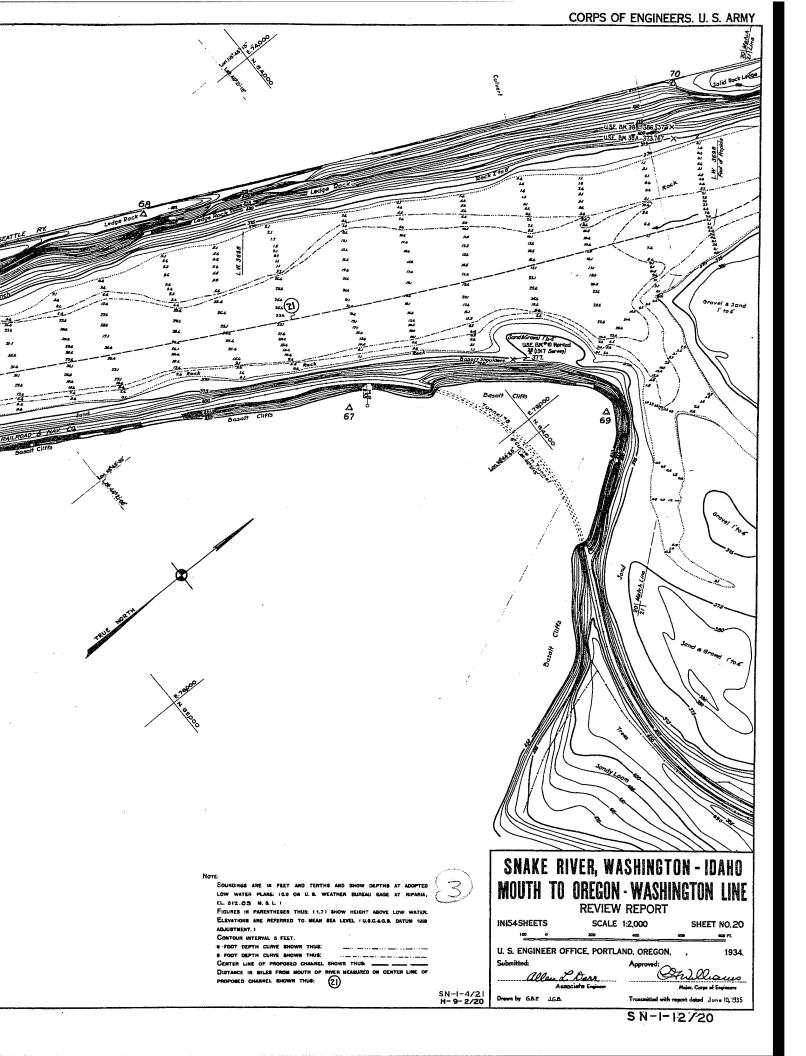


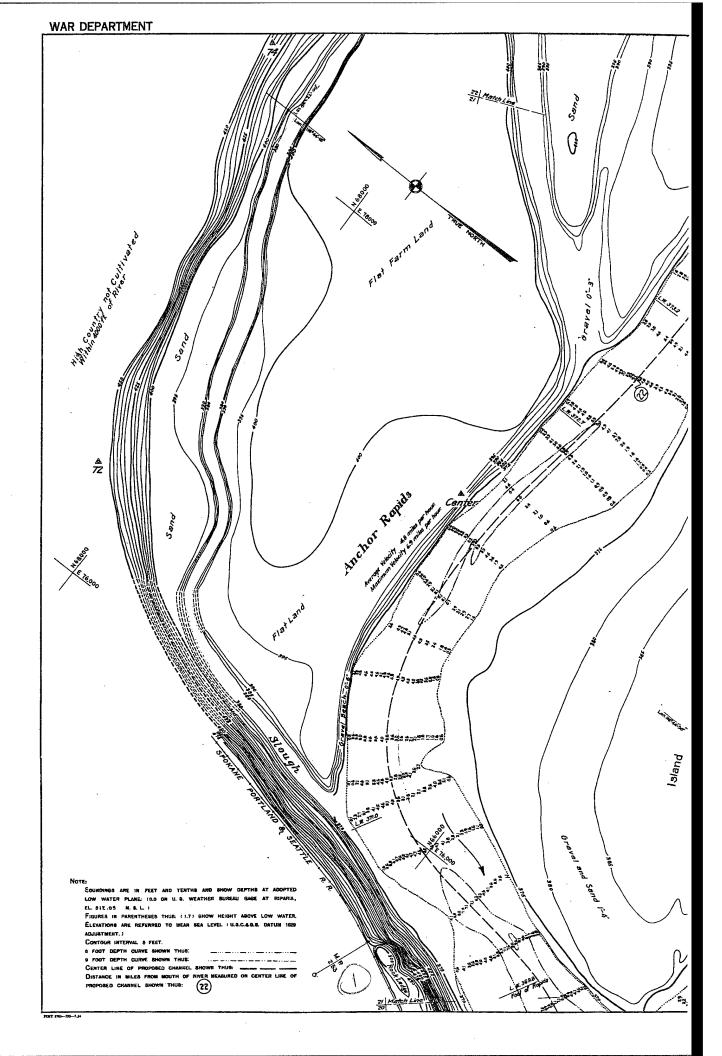




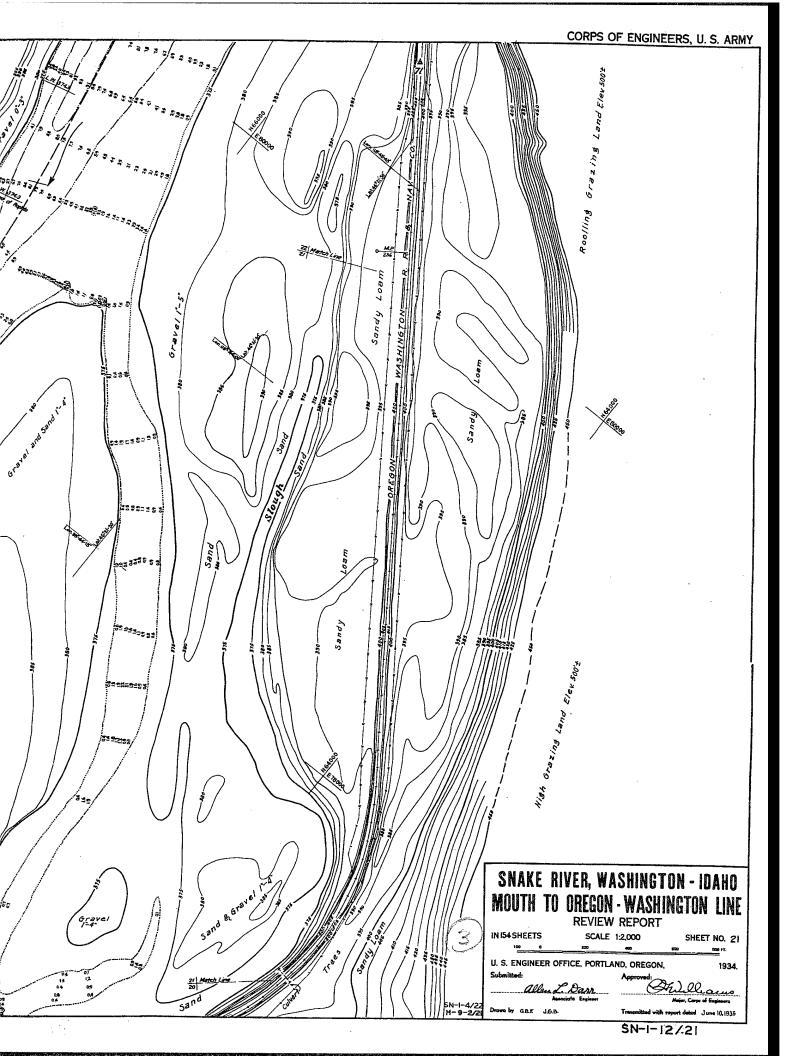


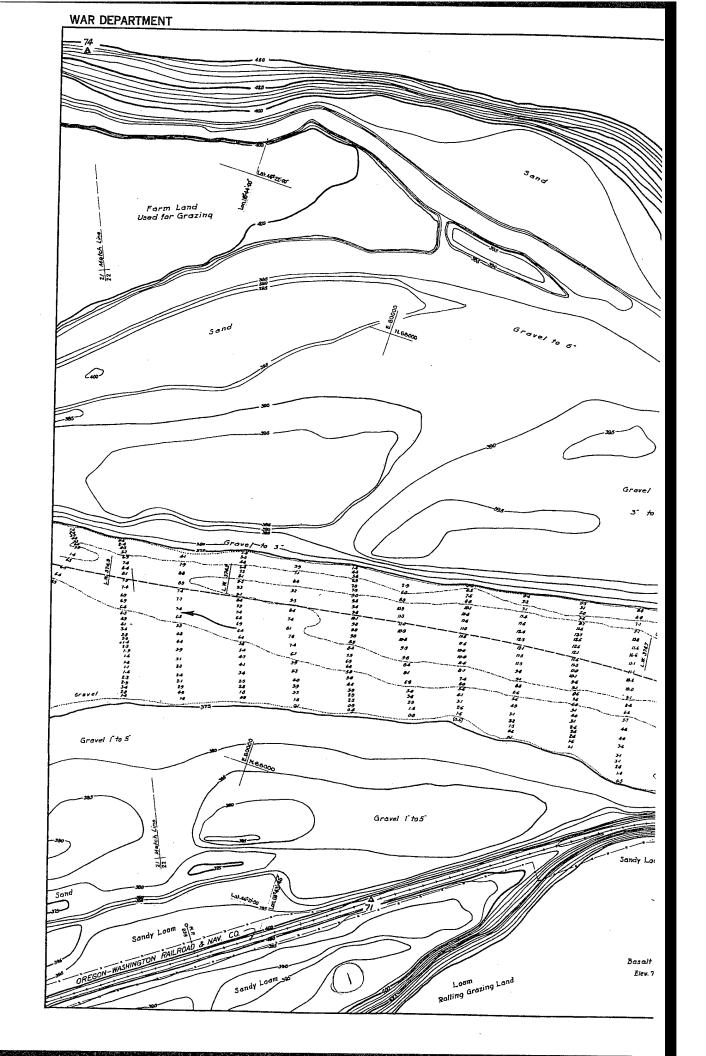




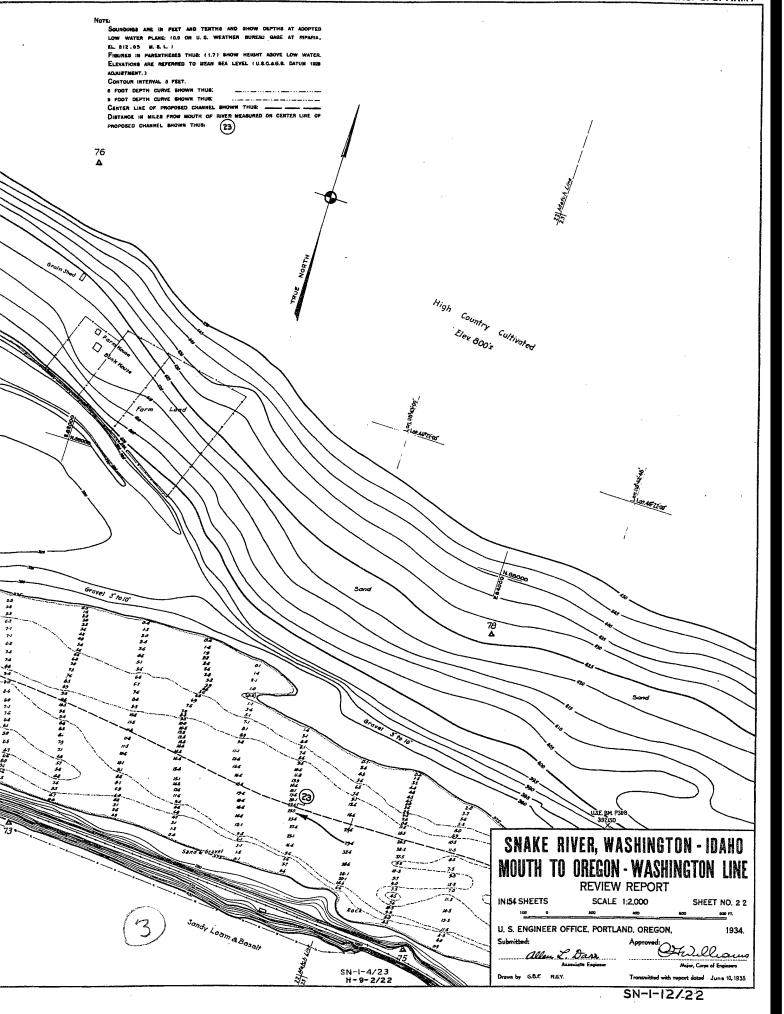


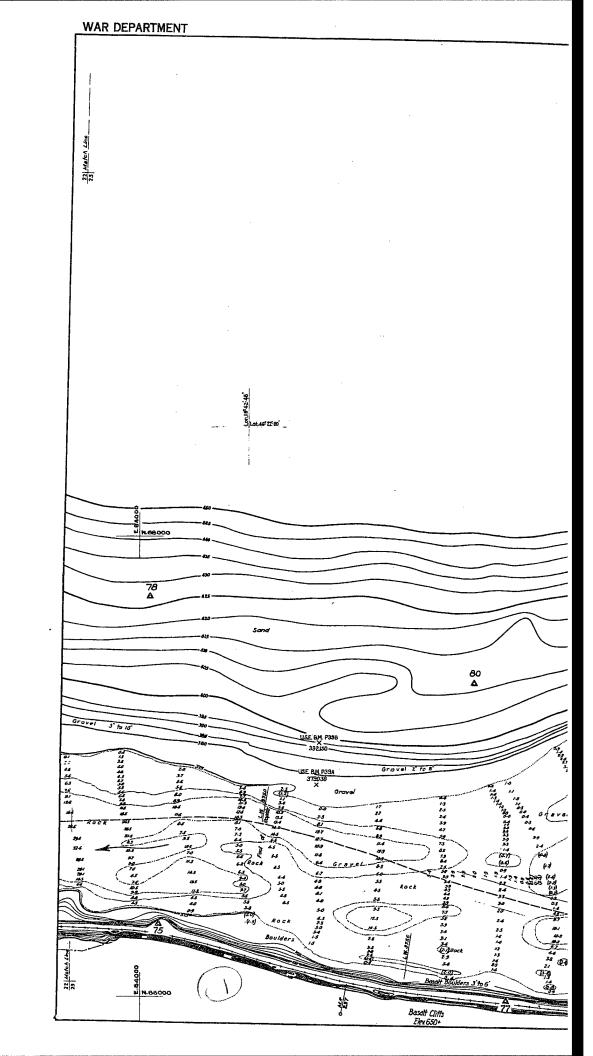


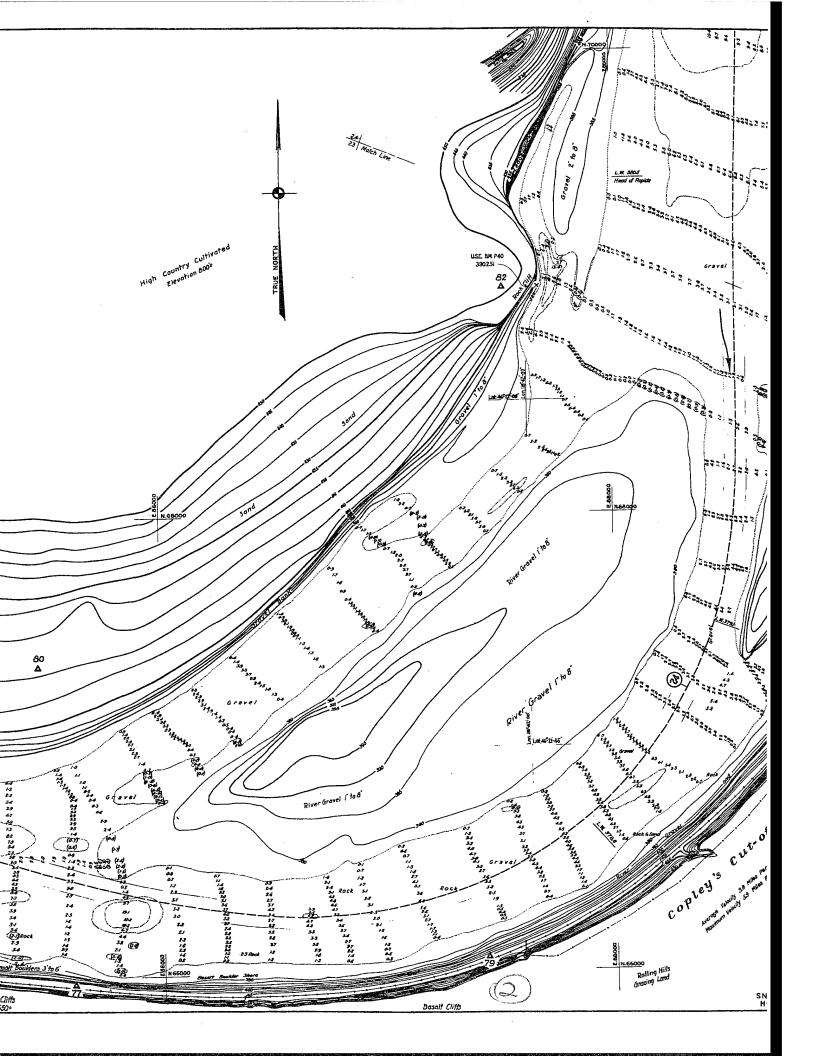


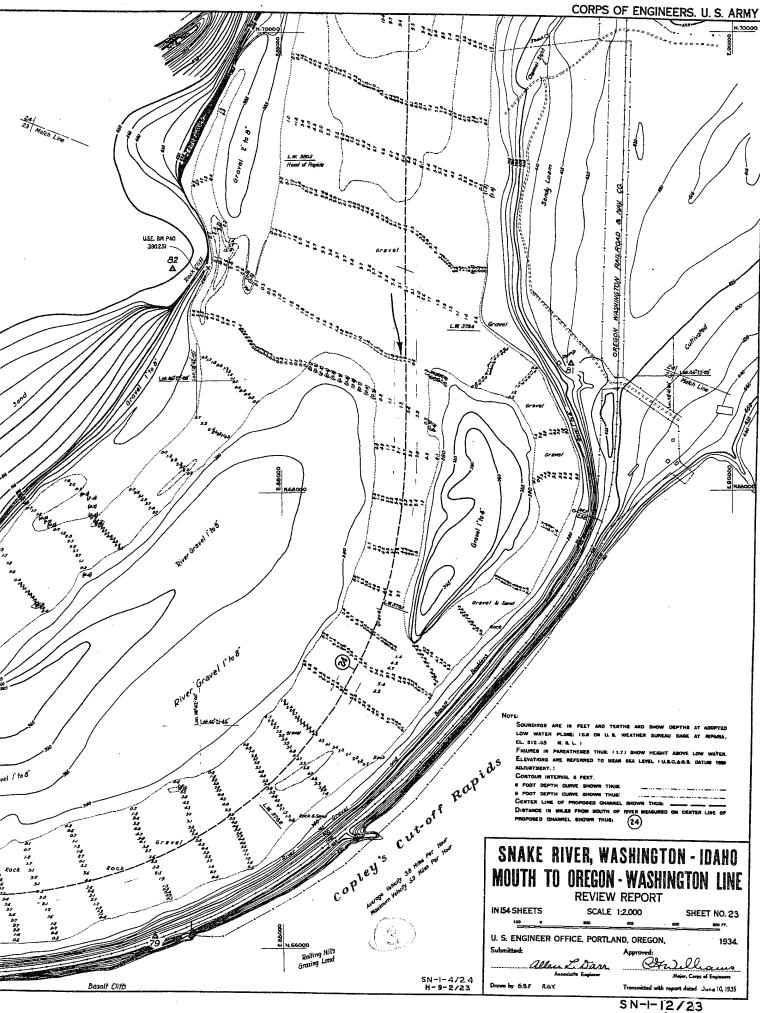


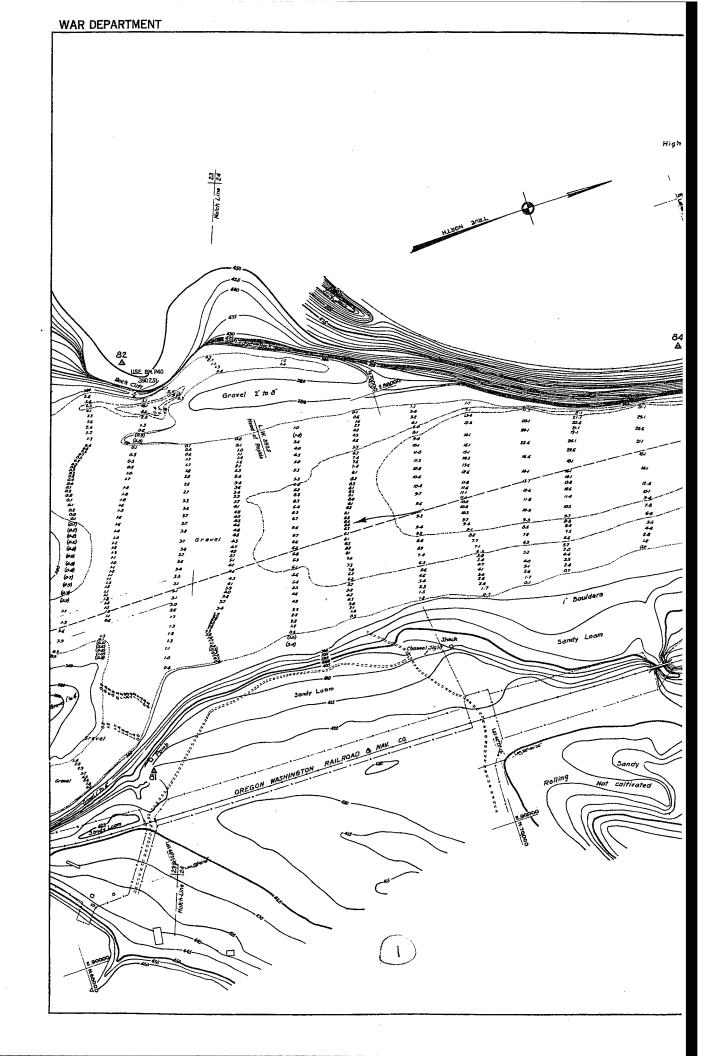


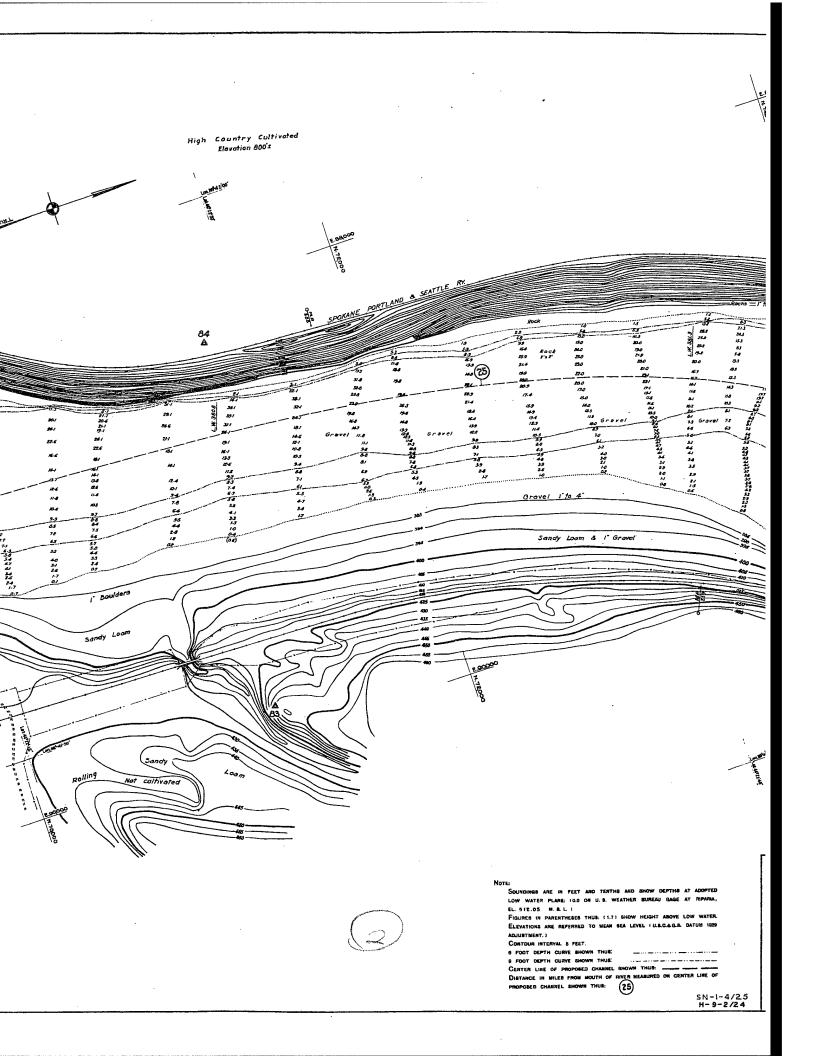


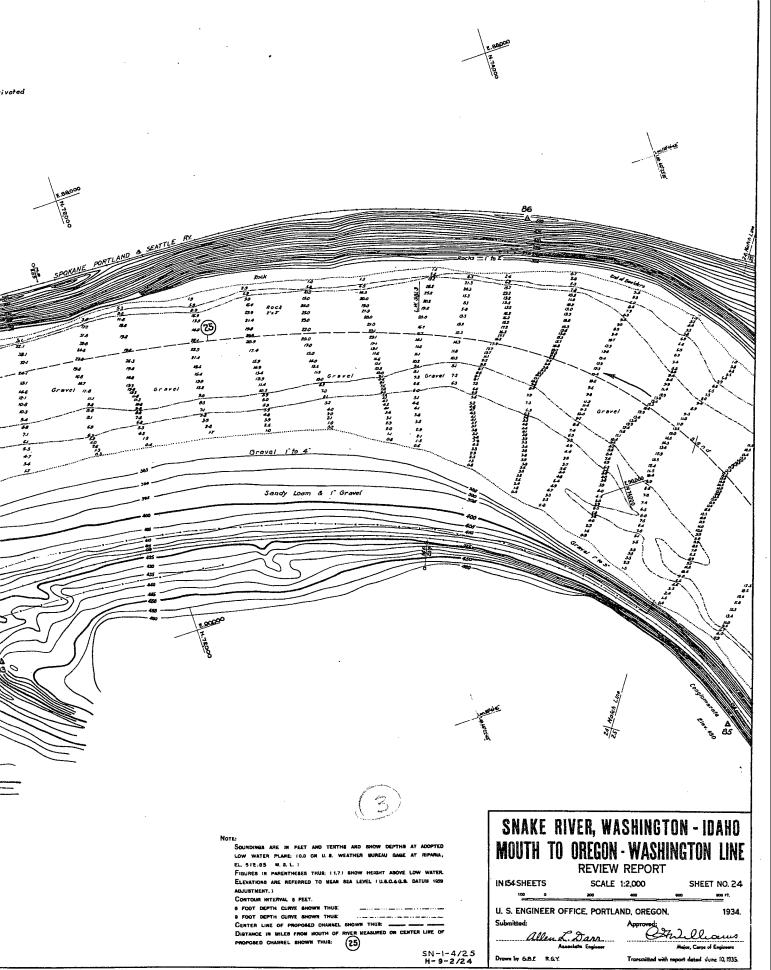


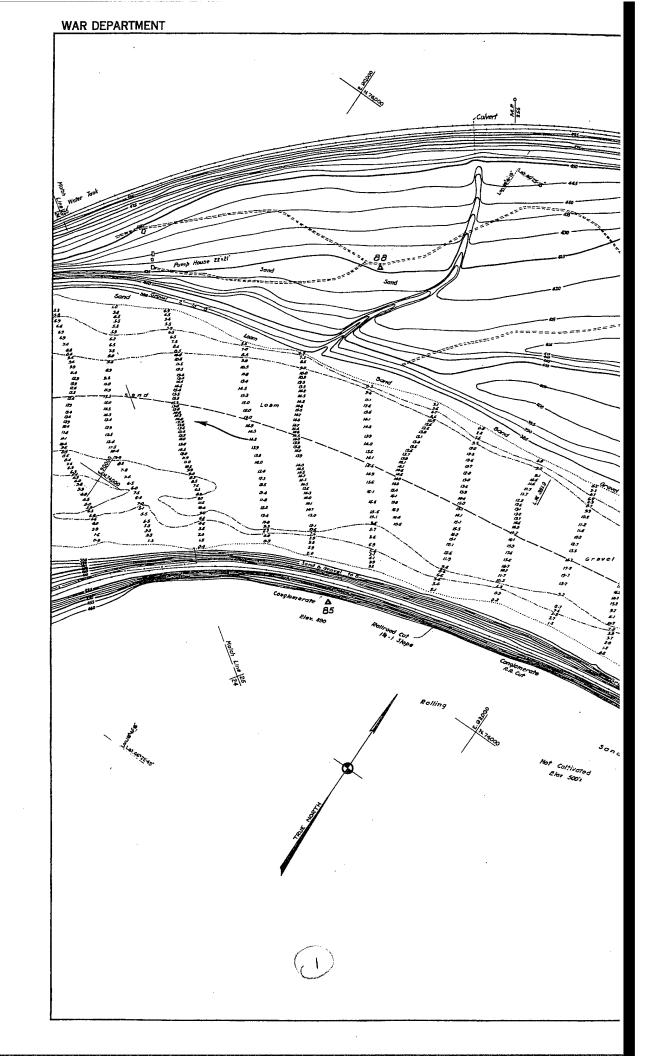


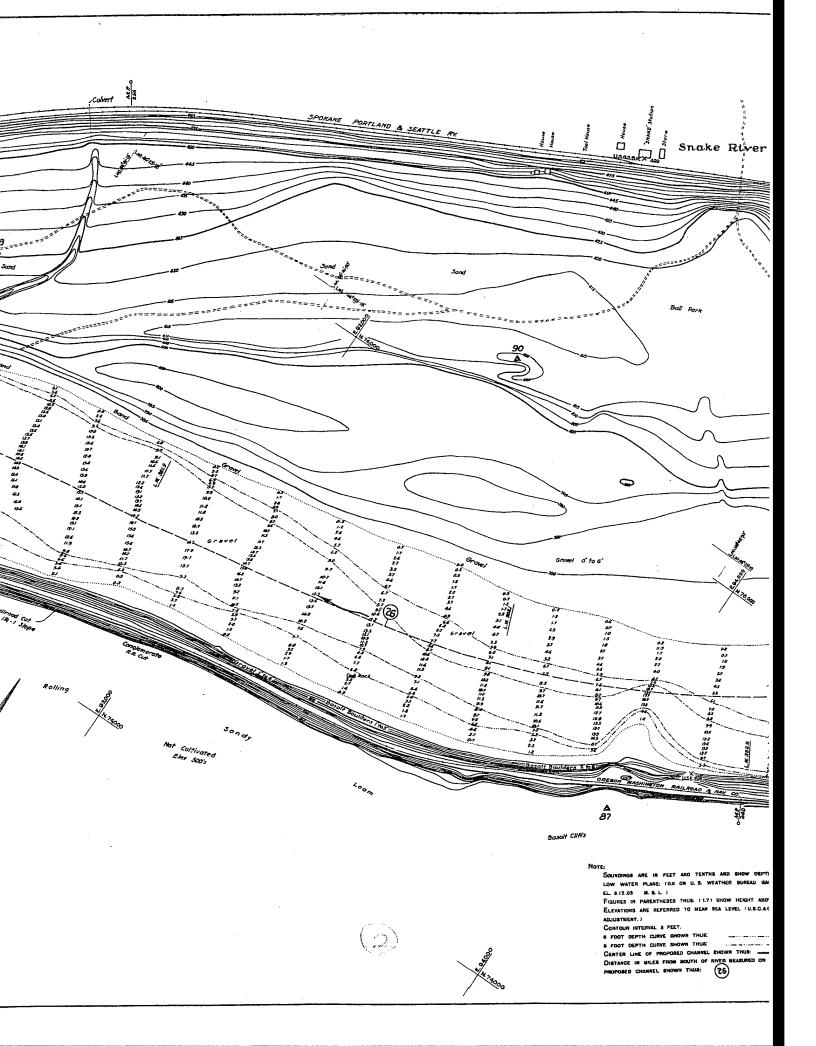


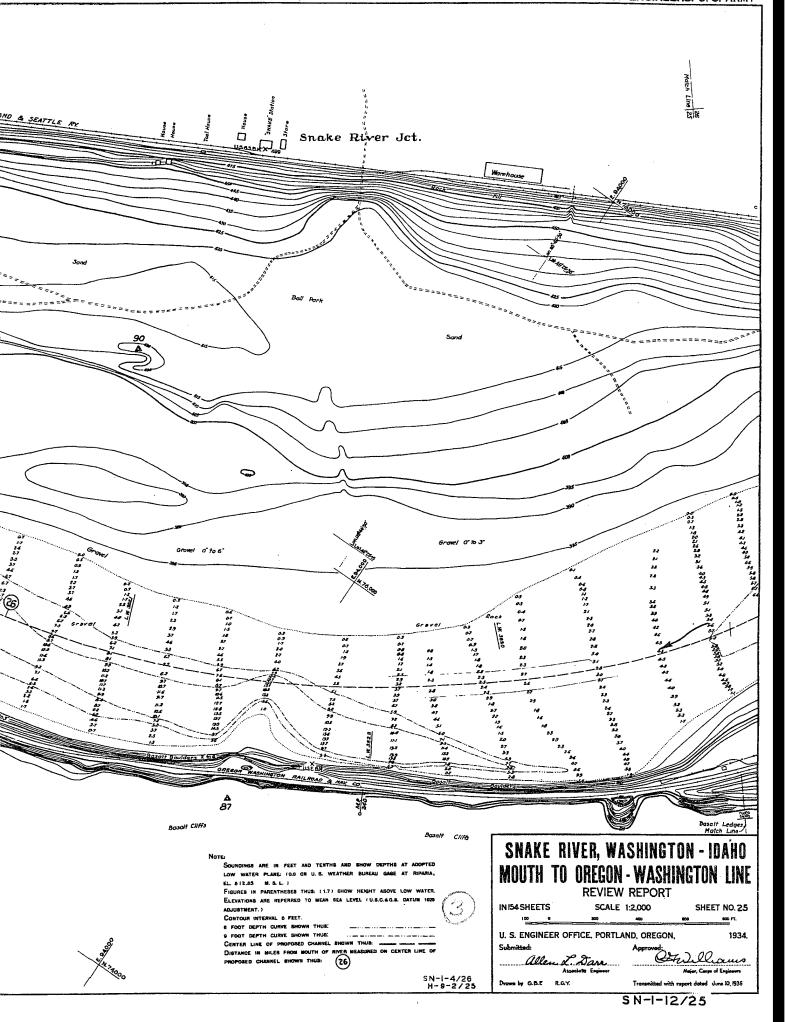


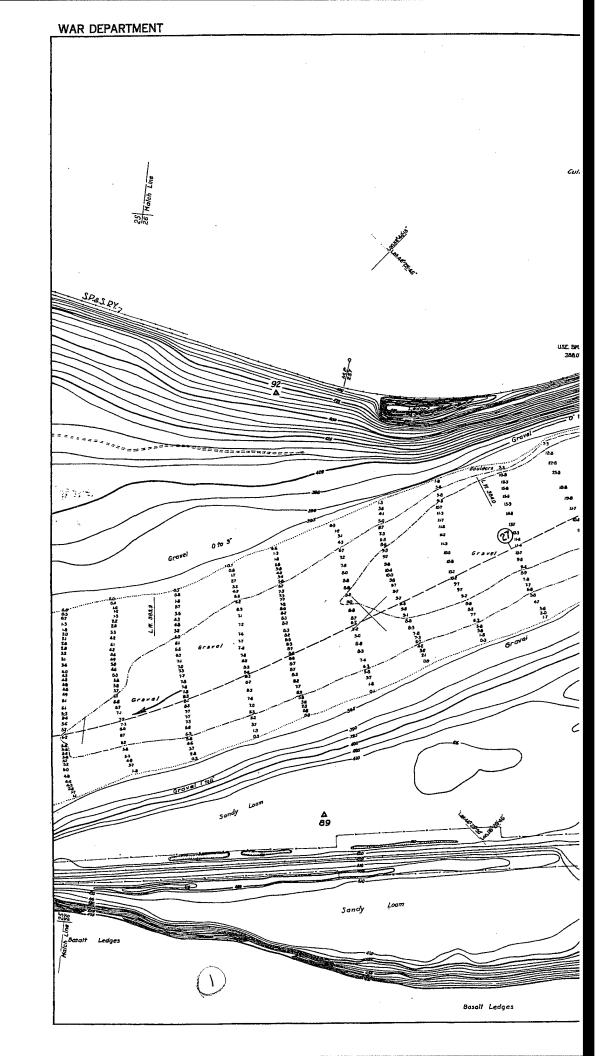


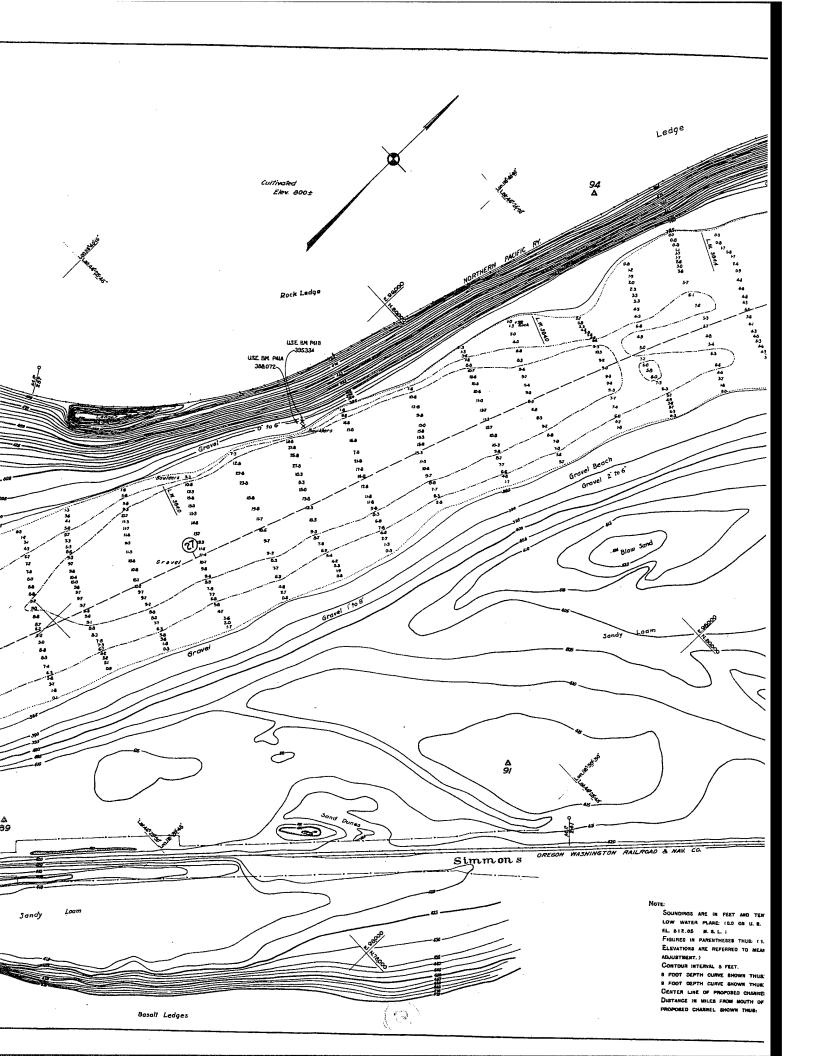


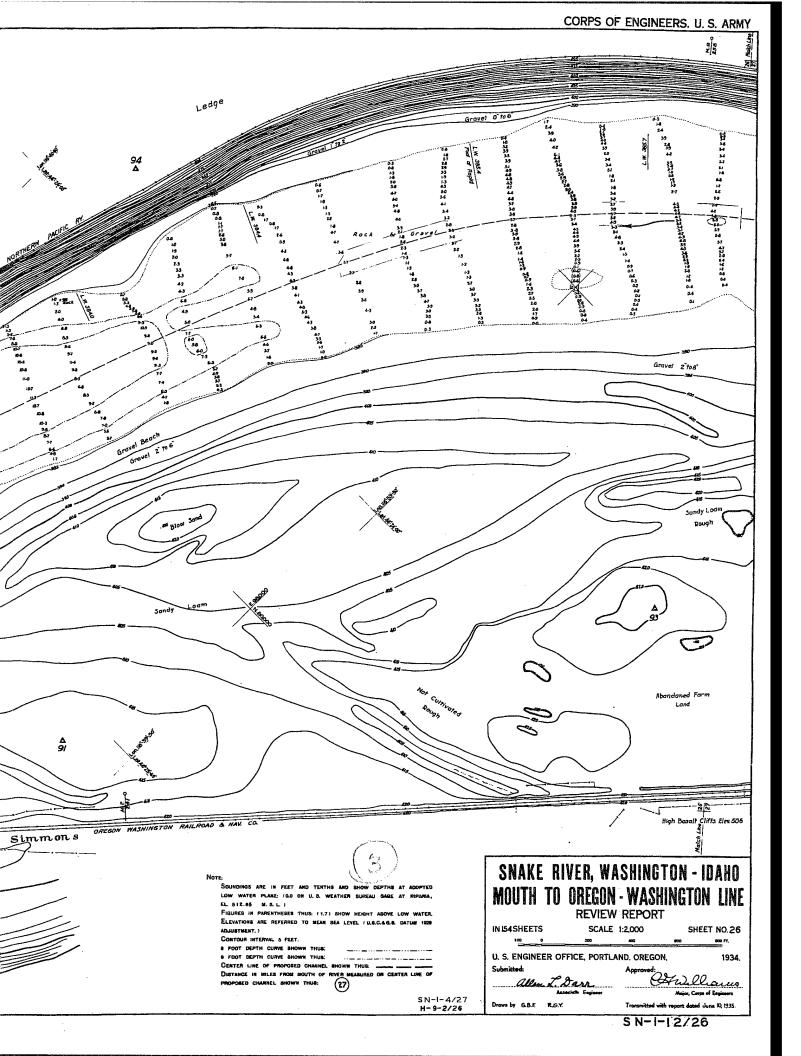


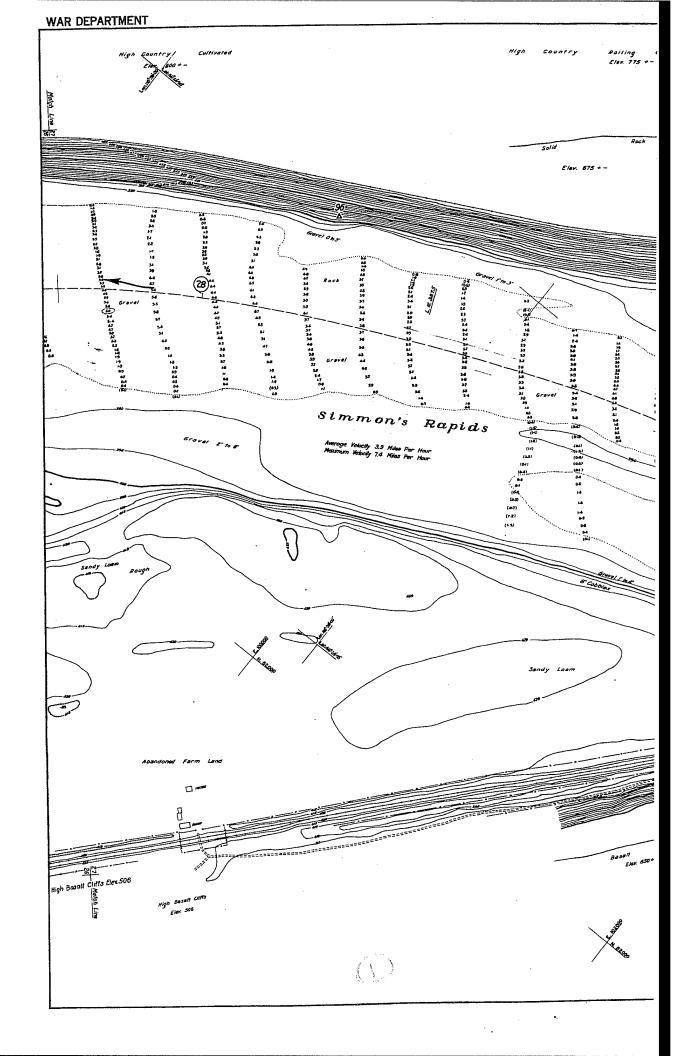


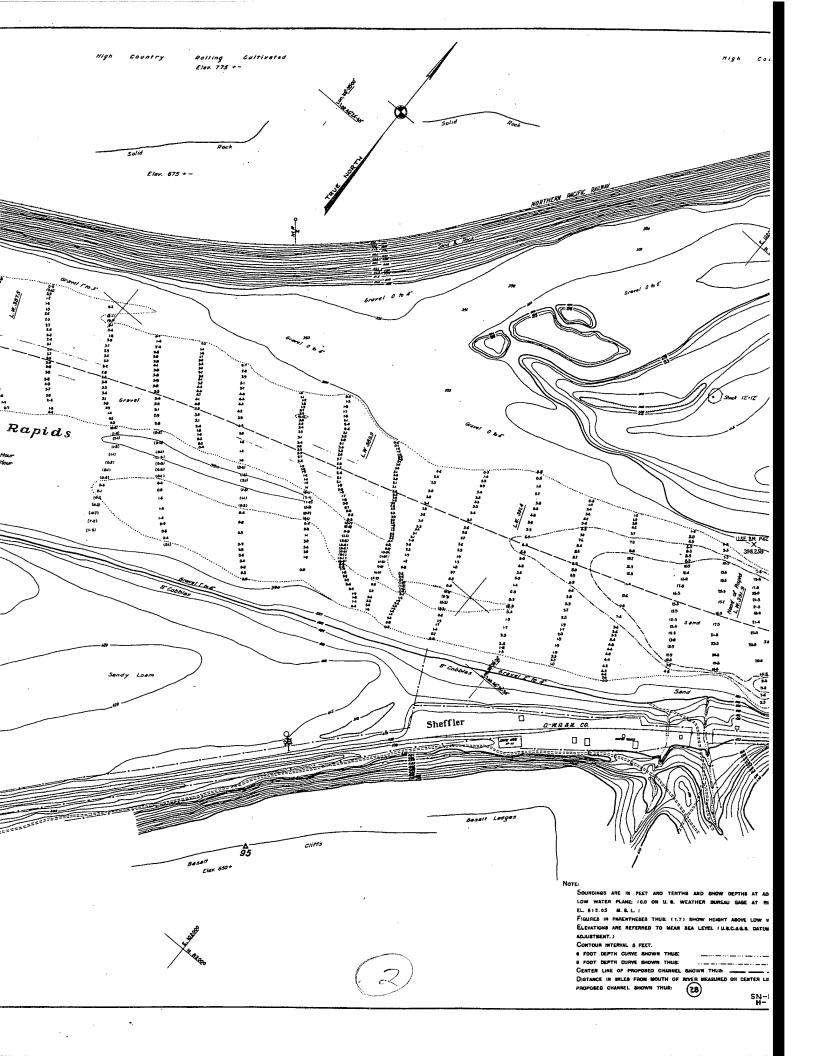


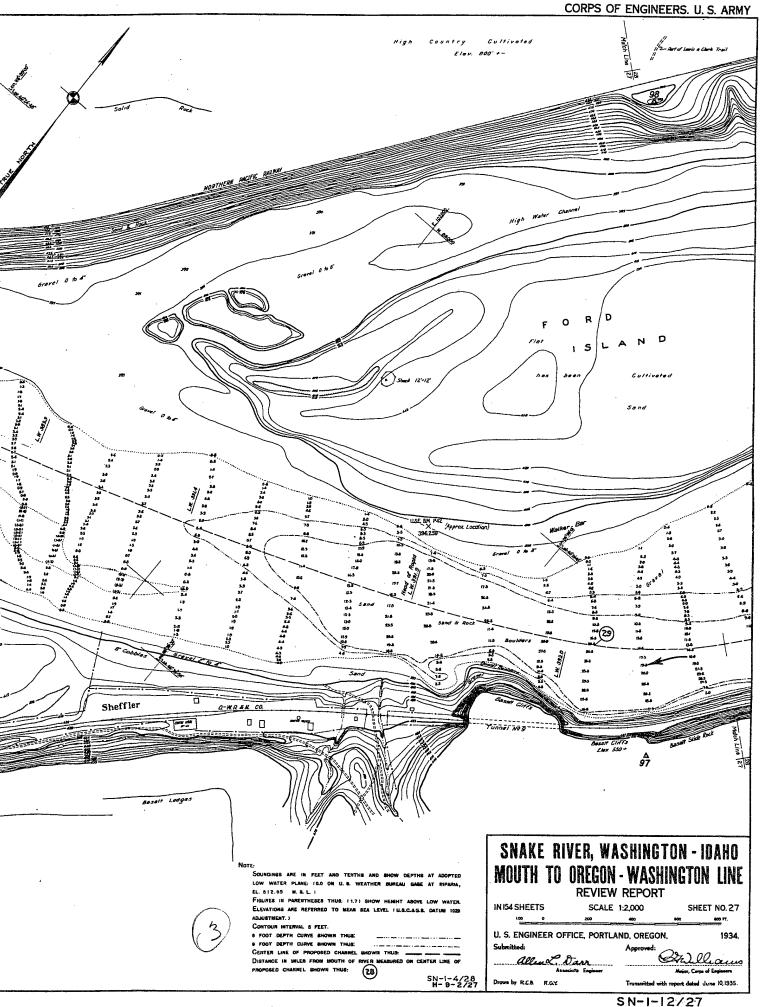


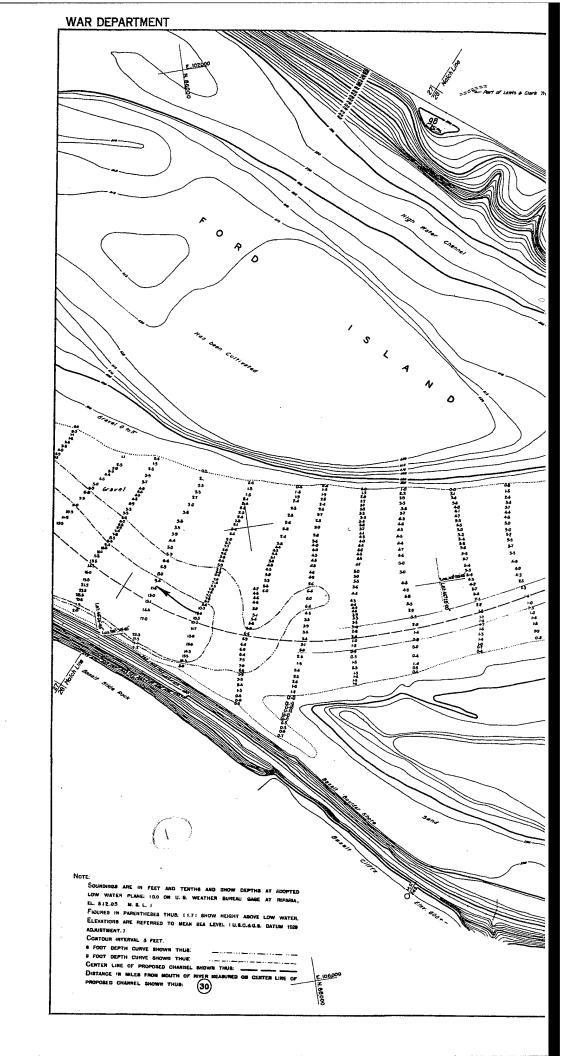


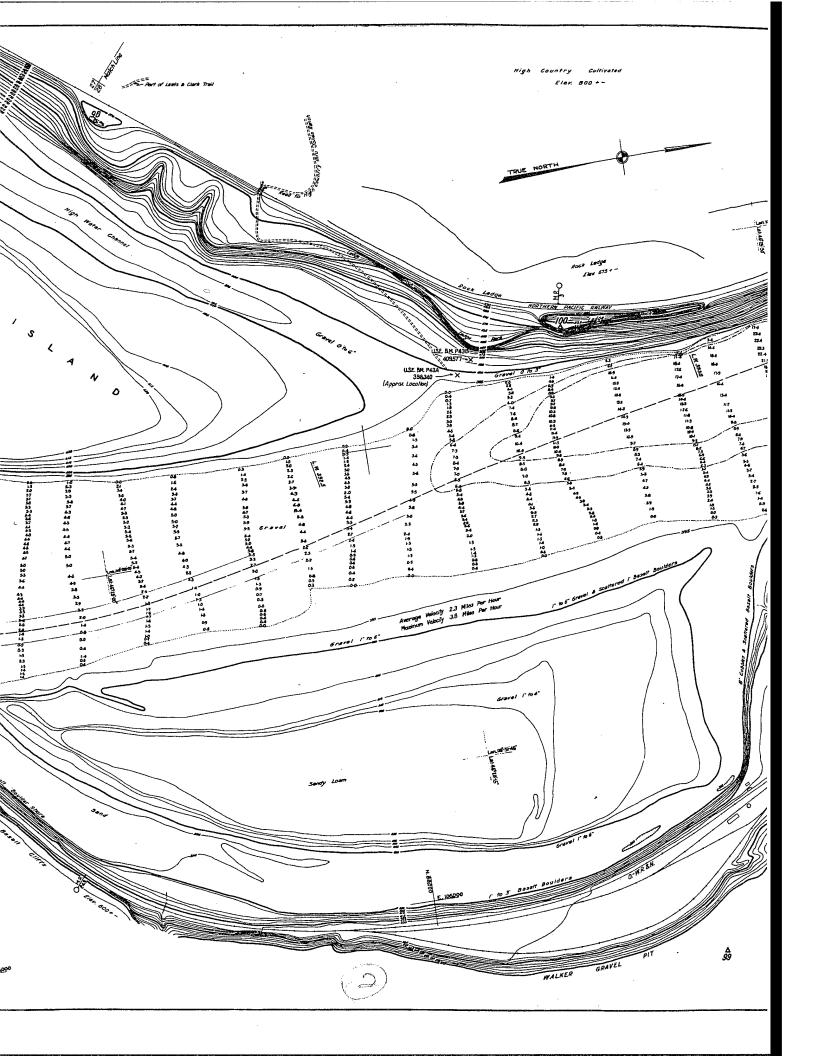


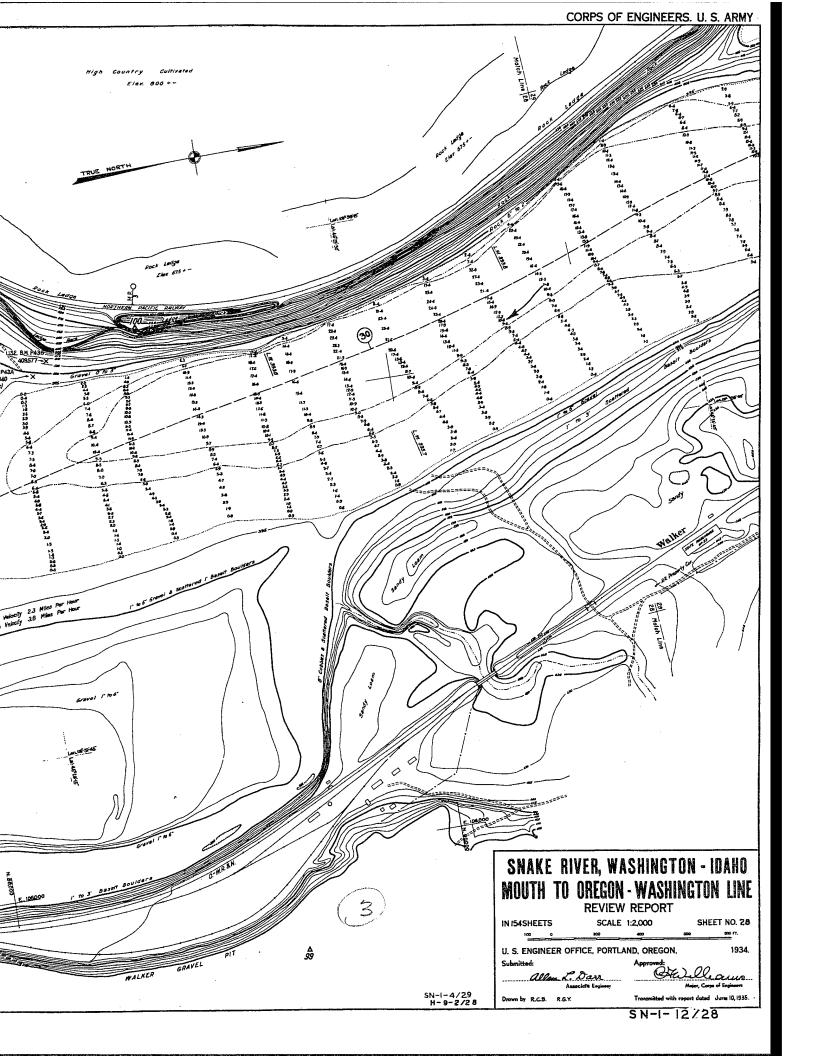


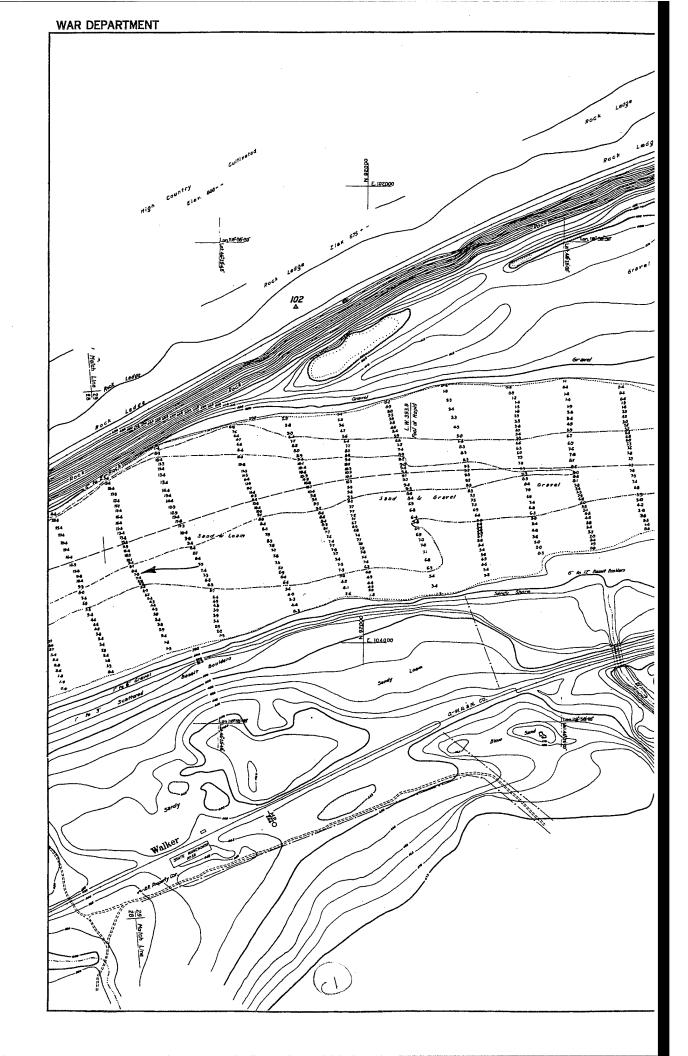




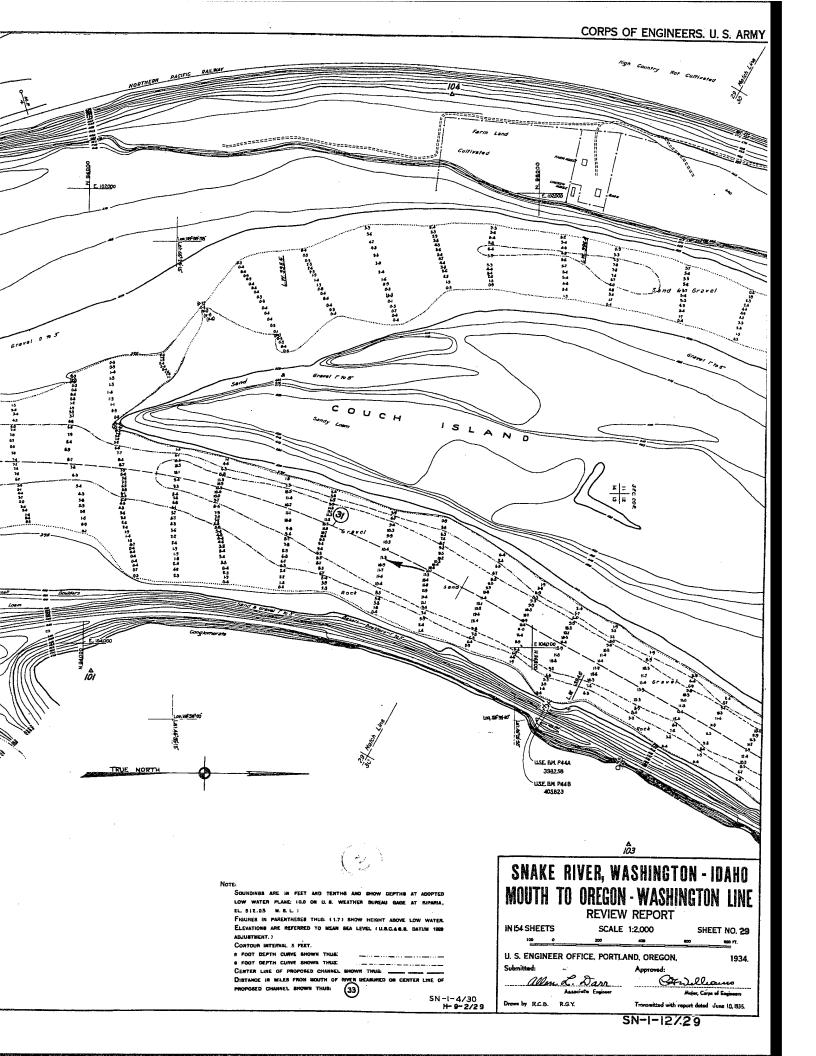


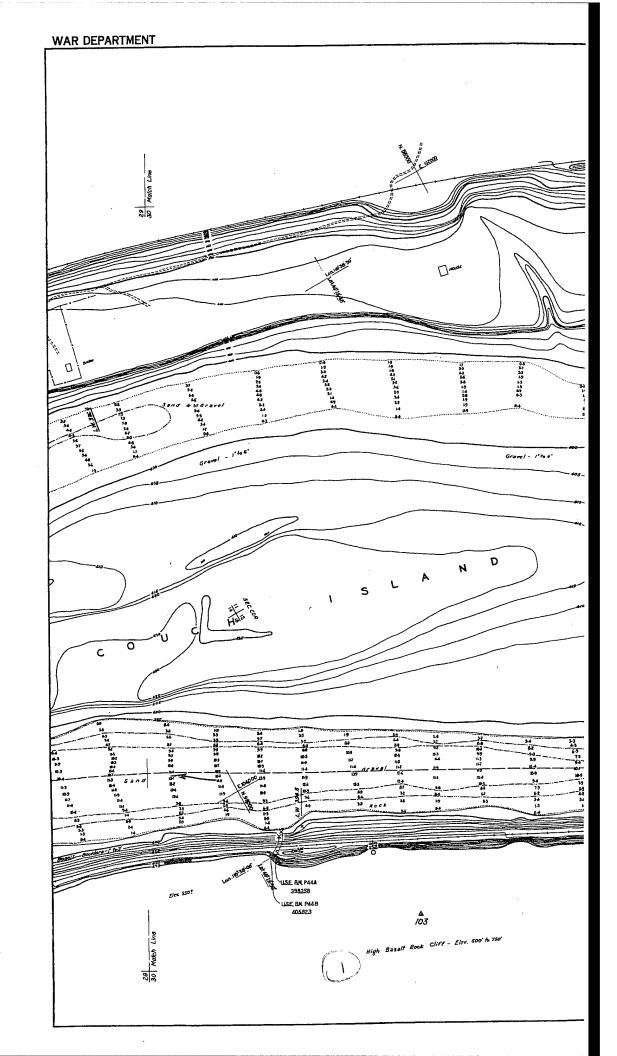


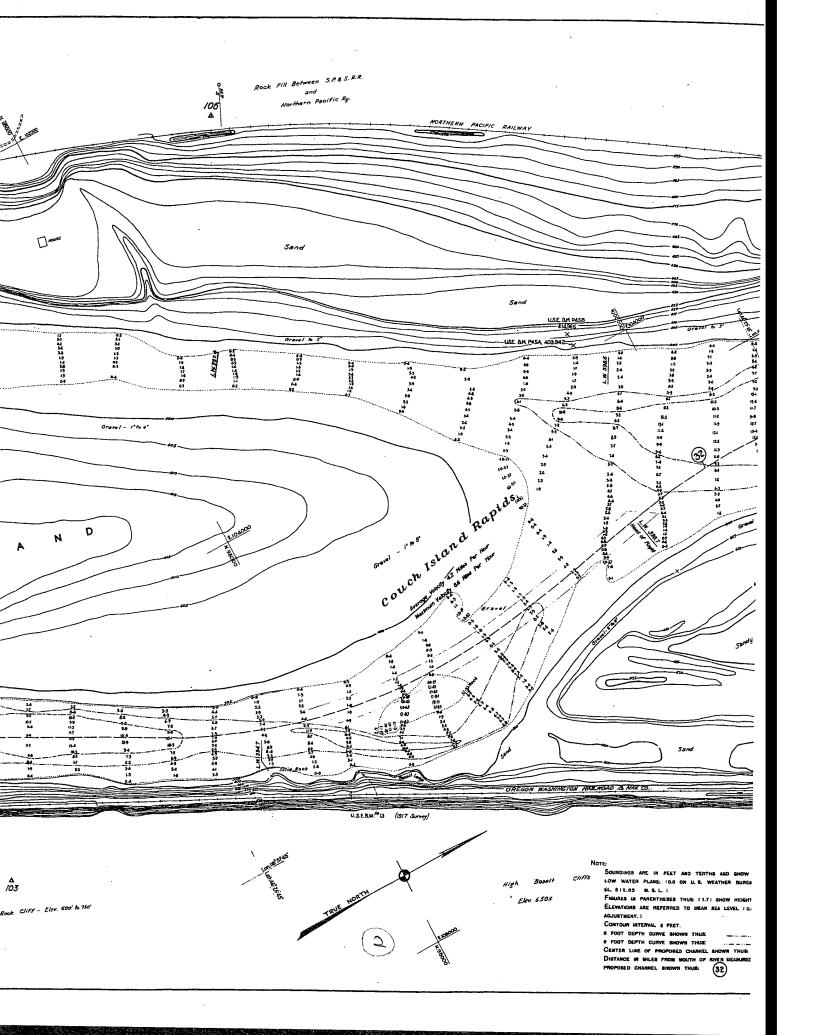


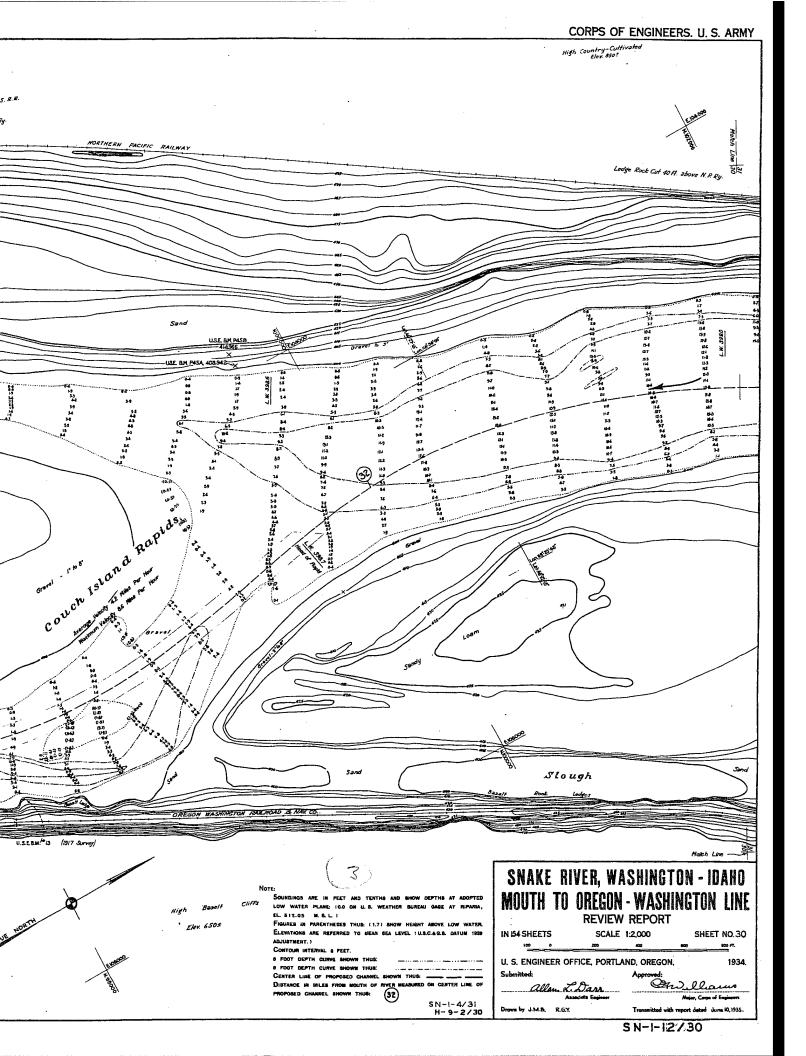


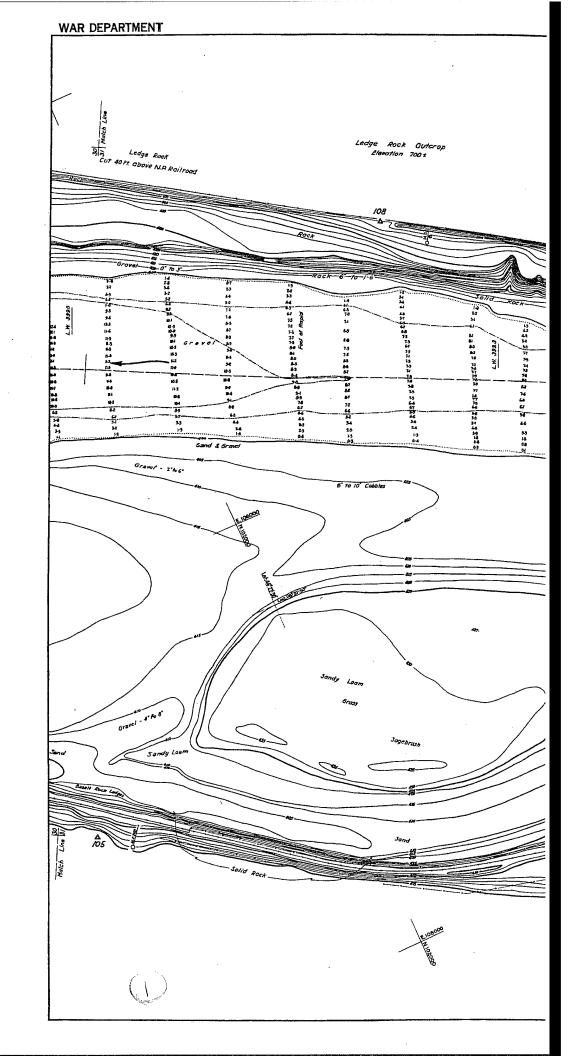






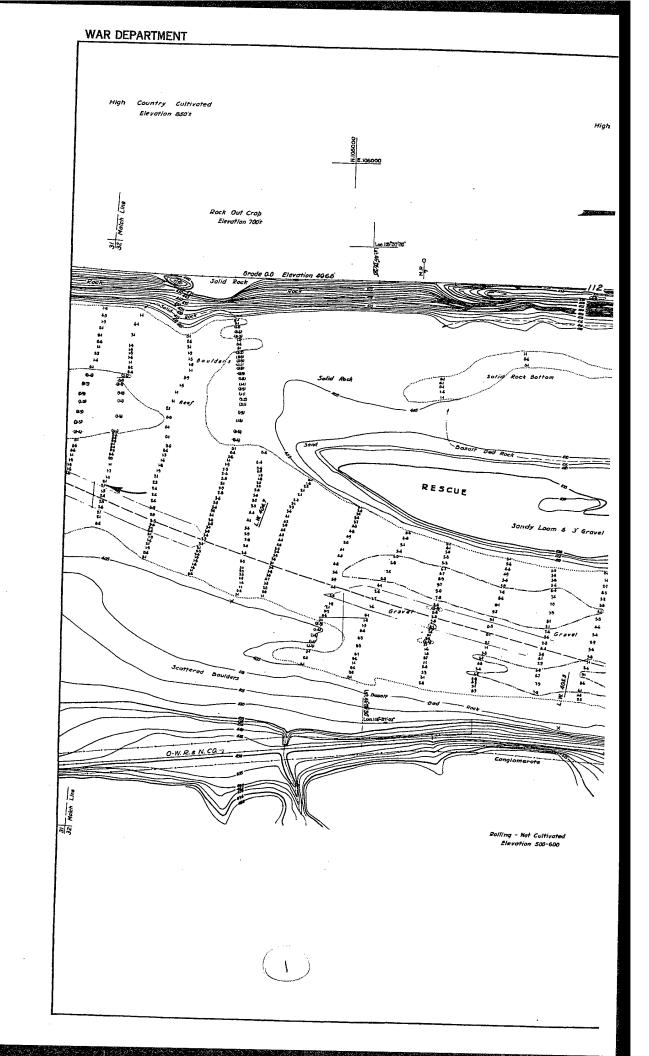


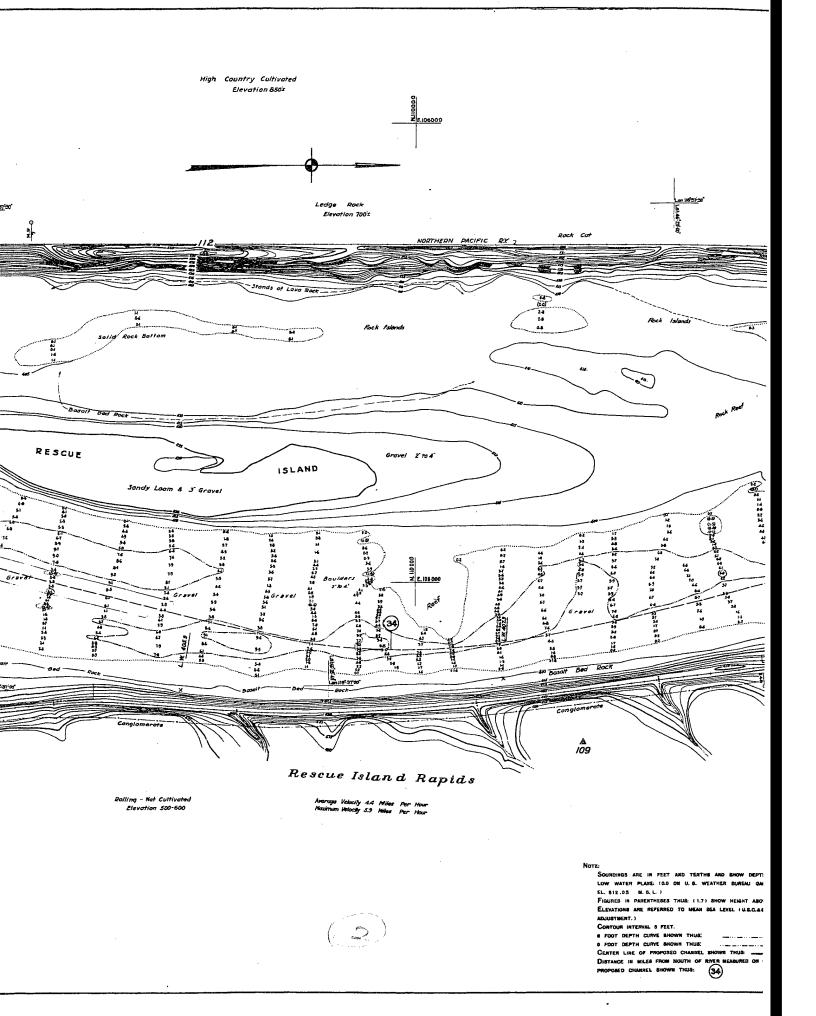


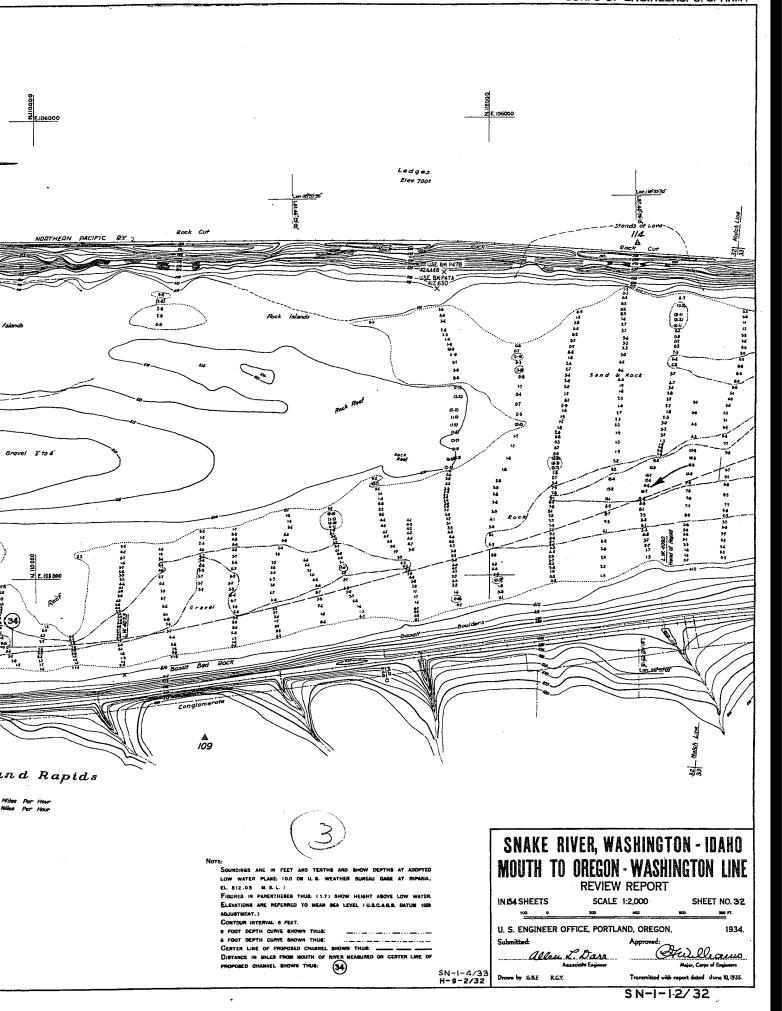


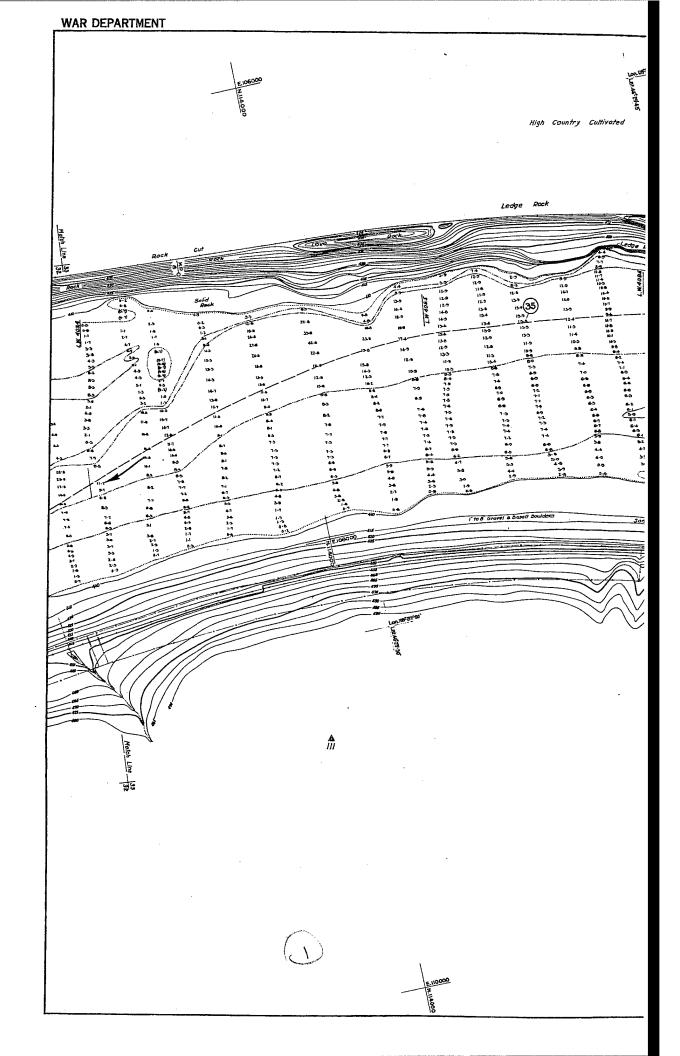










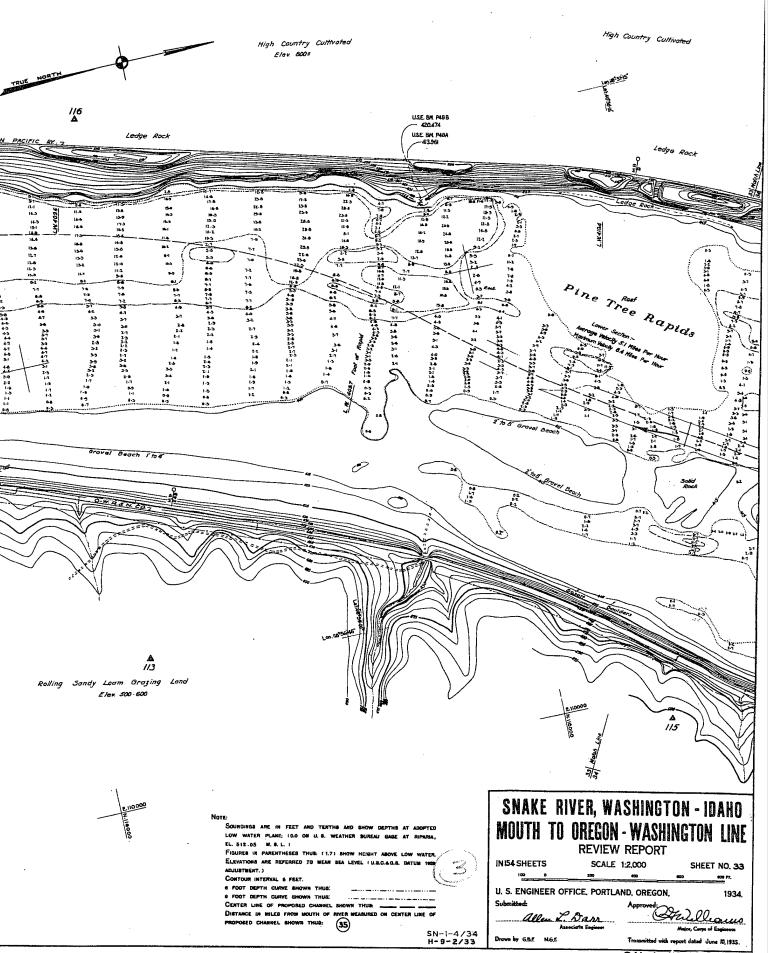


High Country Cuttivated High Country Cultivated Elav. 8001 //6 A USE 8M P488 -- 420474 Ledge Rock Ledge Rock USE BM P48 77-8 13-8 73-9 73-4 73-2 34-8 H-7 12-2 H-8 H-6 H-6 H-6 H-6 H-2 J-6 H-2 11.0 10-7 10-0 10-1 10-0 10-1 10-0 10-1 10-0 10-1 10-0 10-1 10-0 10-1 10-0 10-1 10-0 10-1 10-0 1 54 54 47 44 57 54 51 27 15 16 14 44.4.4.50 5 4 459 14 151 144 164 159 151 <u>A</u> //3 Rolling Sandy Loam Grazing Land Eler. 500 - 600 LOW WATER PLANE: (0.0 ON U. S. WEATHER BUREAU GAGE AT EL. 512.05 M. S. L.) FIGUIRES IN PARENTHESES THUS: (1.7) SHOW HEIGHT ABOVE LOW ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL (U.S.C.&G.S. DATUM 1889) ADJUSTMENT, 3 CONTOUR INTERVAL 6 FEET.
8 FOOT DEPTH CURVE SHOWN THUS:
9 FOOT DEPTH CURVE SHOWN THUS: 8 FOOT DEPTH CURVE SHOWN THUS:

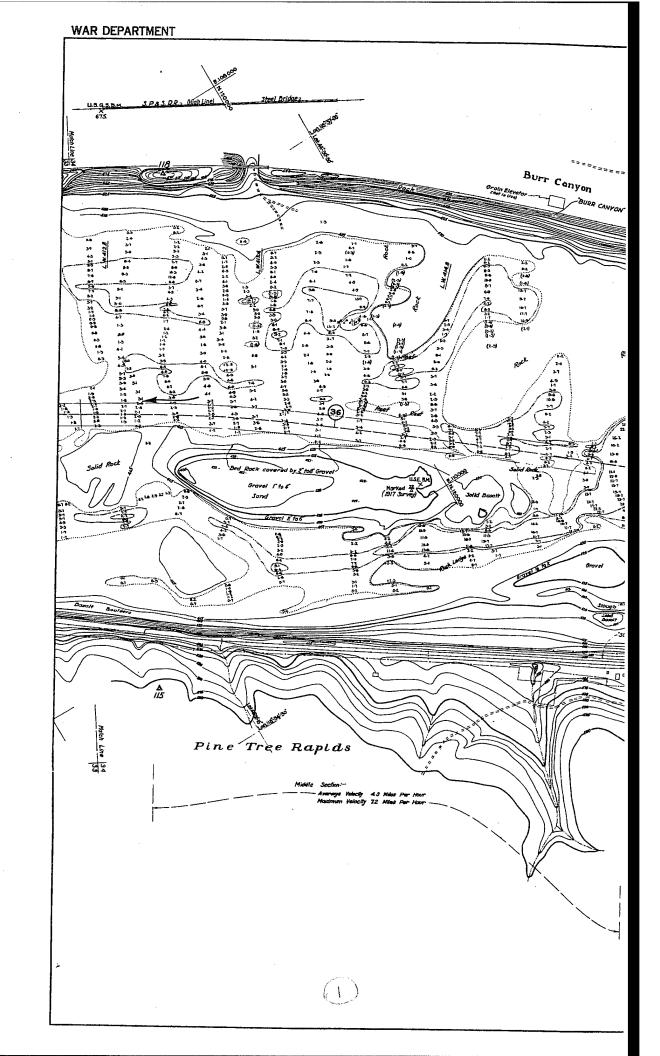
CENTER LINE OF PROPOSED CHARNEL SHOWN THUS:

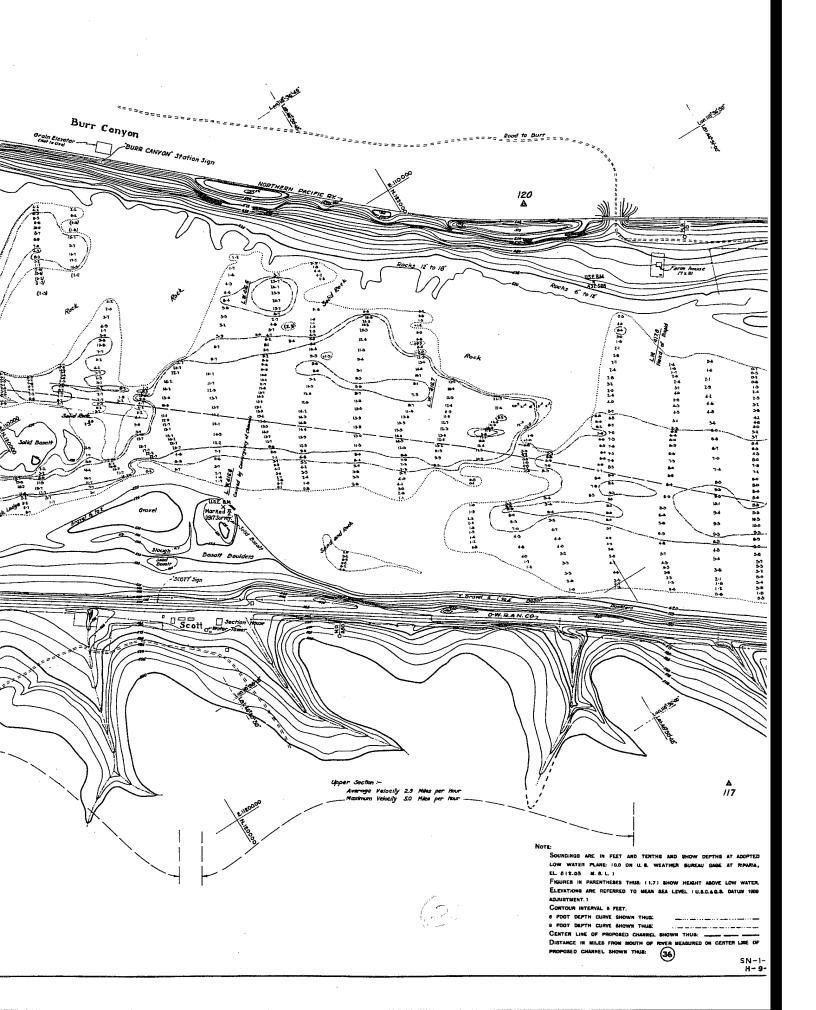
DISTANCE IN BILLES FROS BOUTH OF RIVER BEASURED ON CENTER LINE OF PROPOSED CHARREL SHOWN THUS:

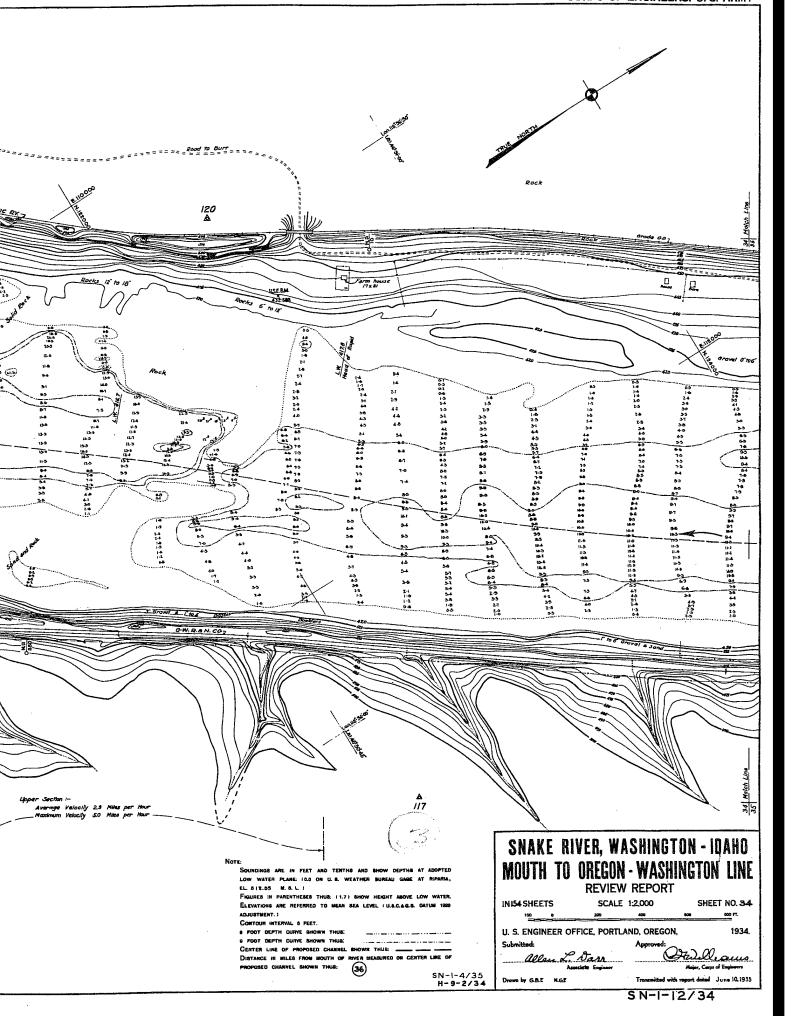
(S5) SN-1-H-9-;

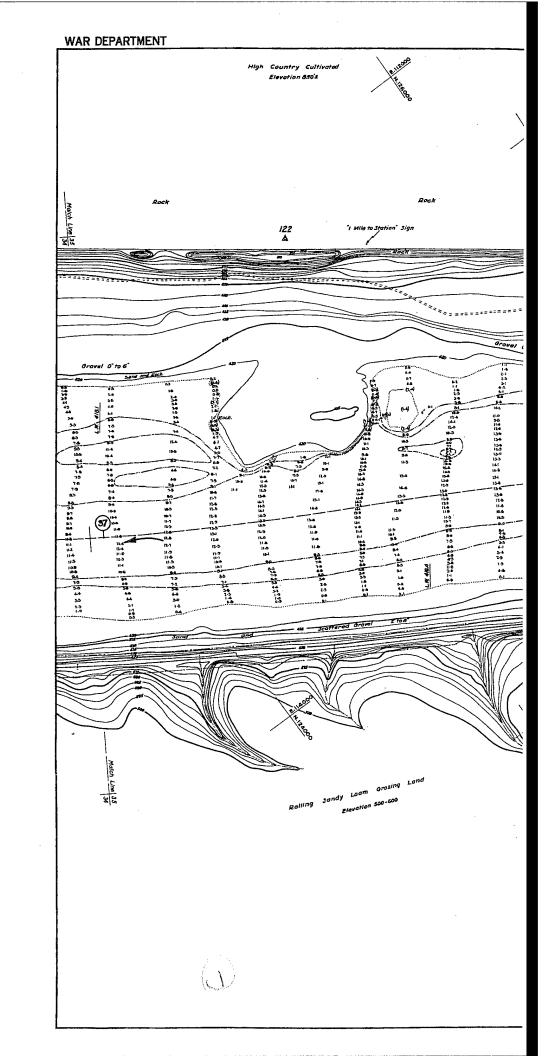


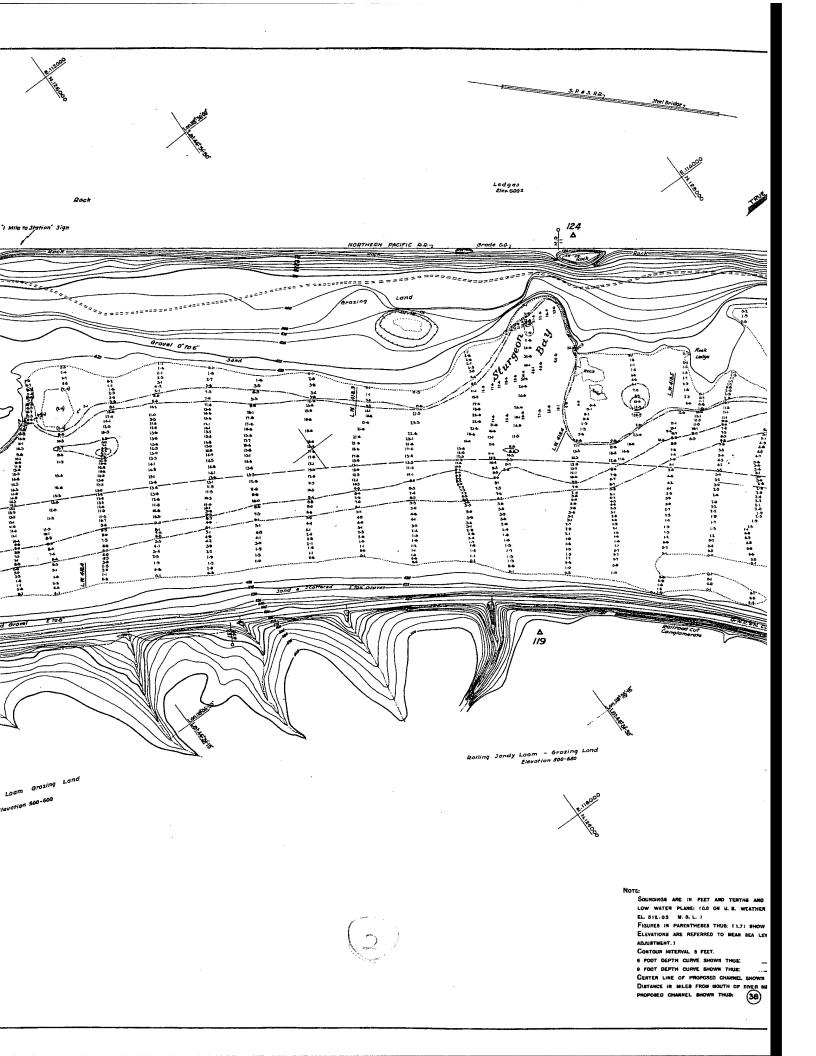
SN-1-12/33

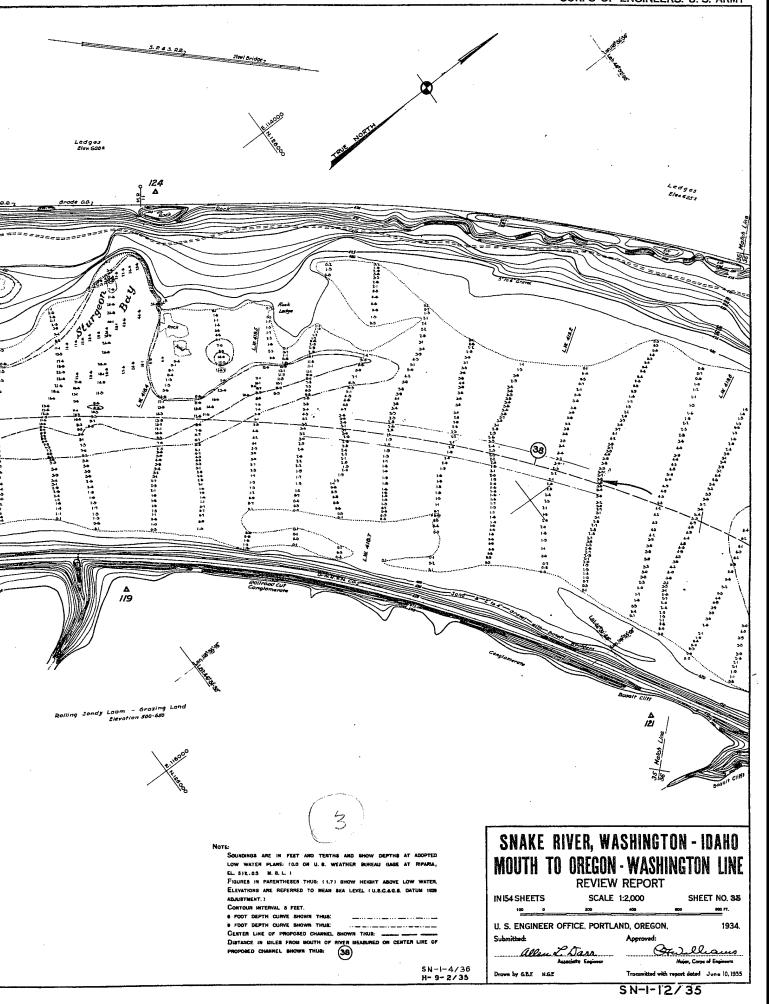


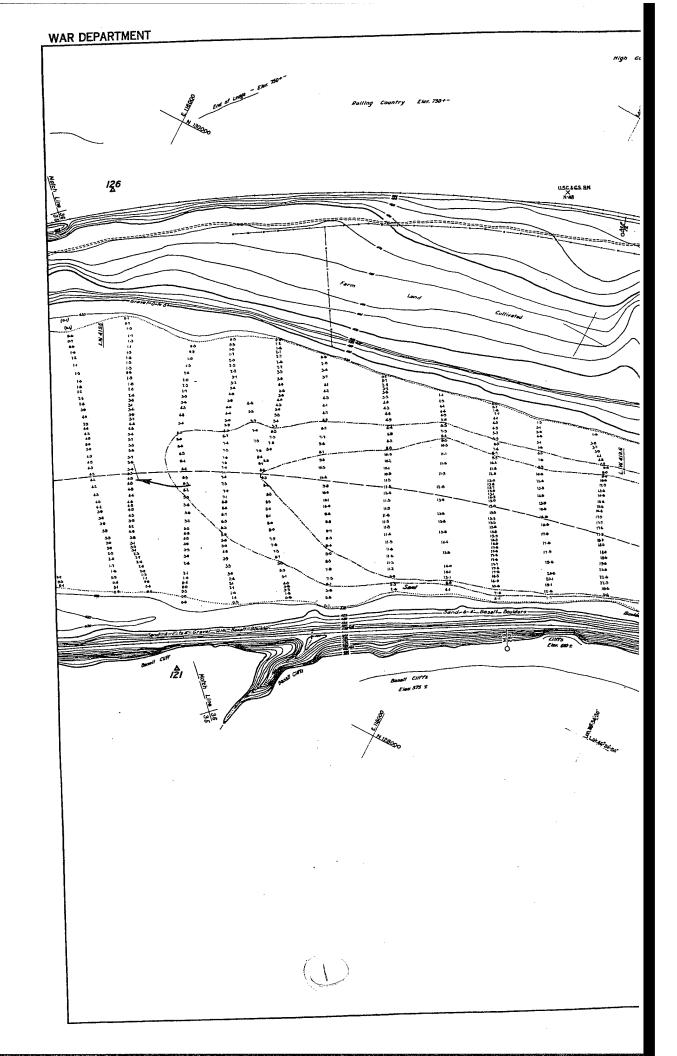


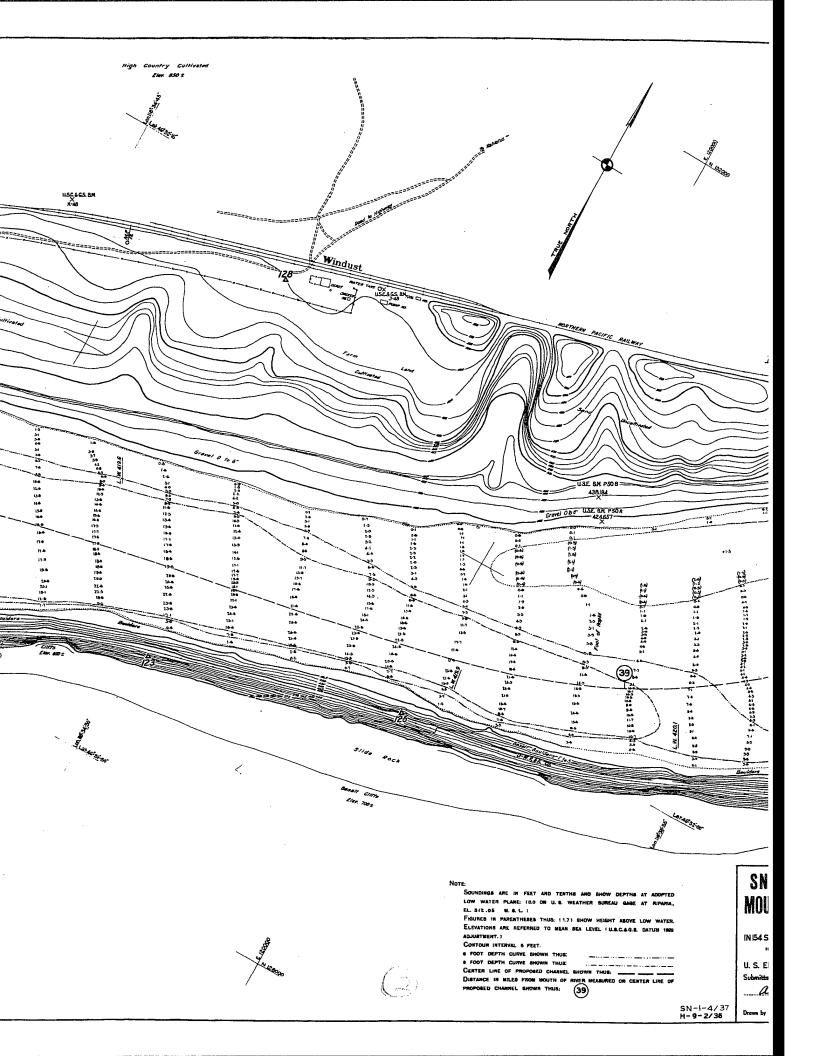


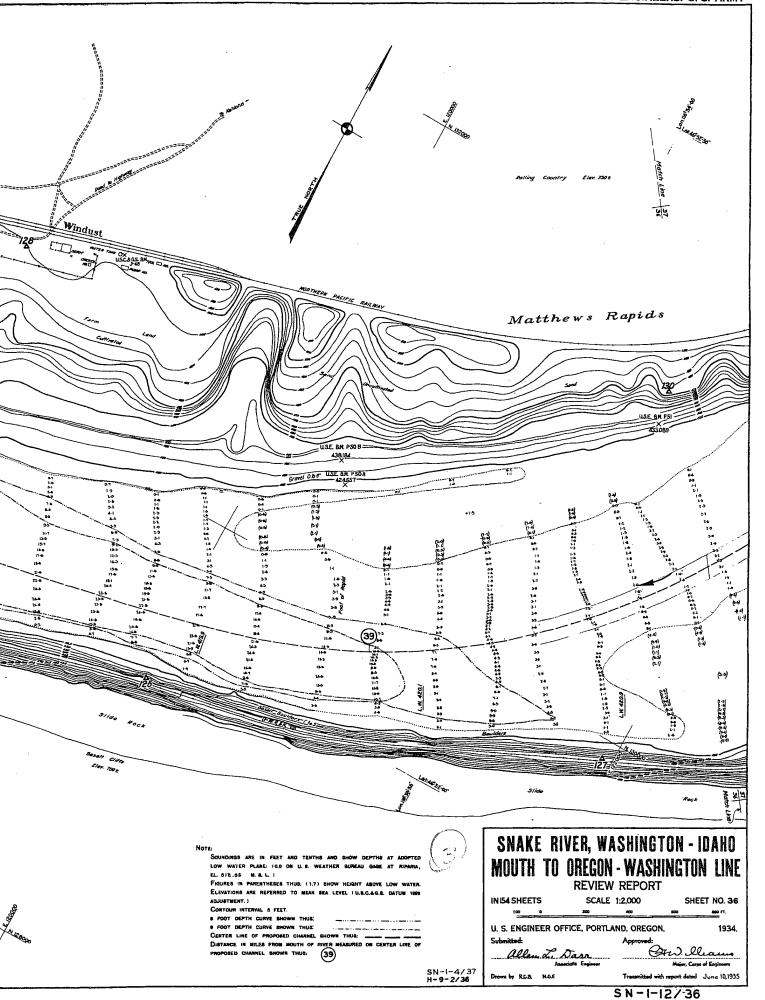


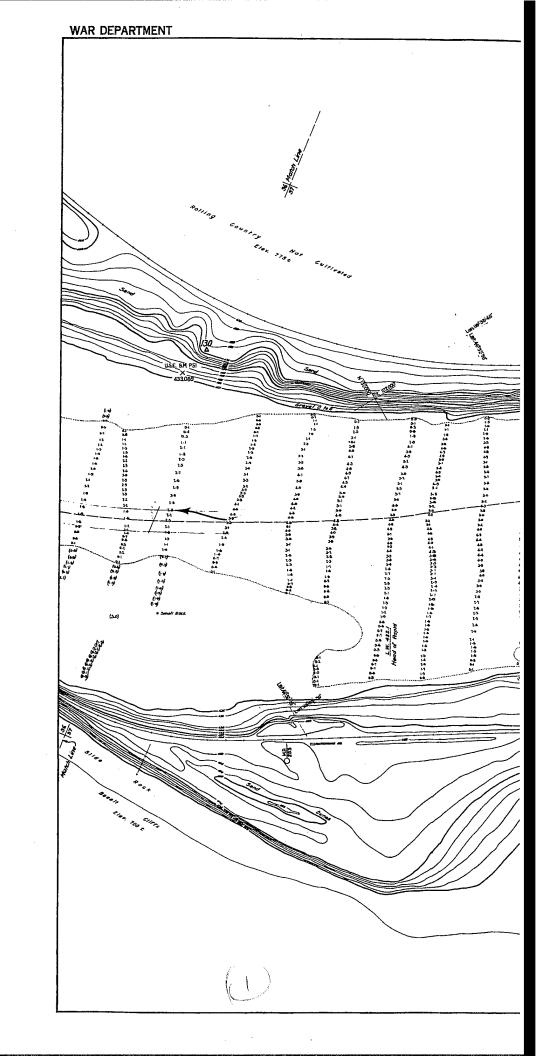


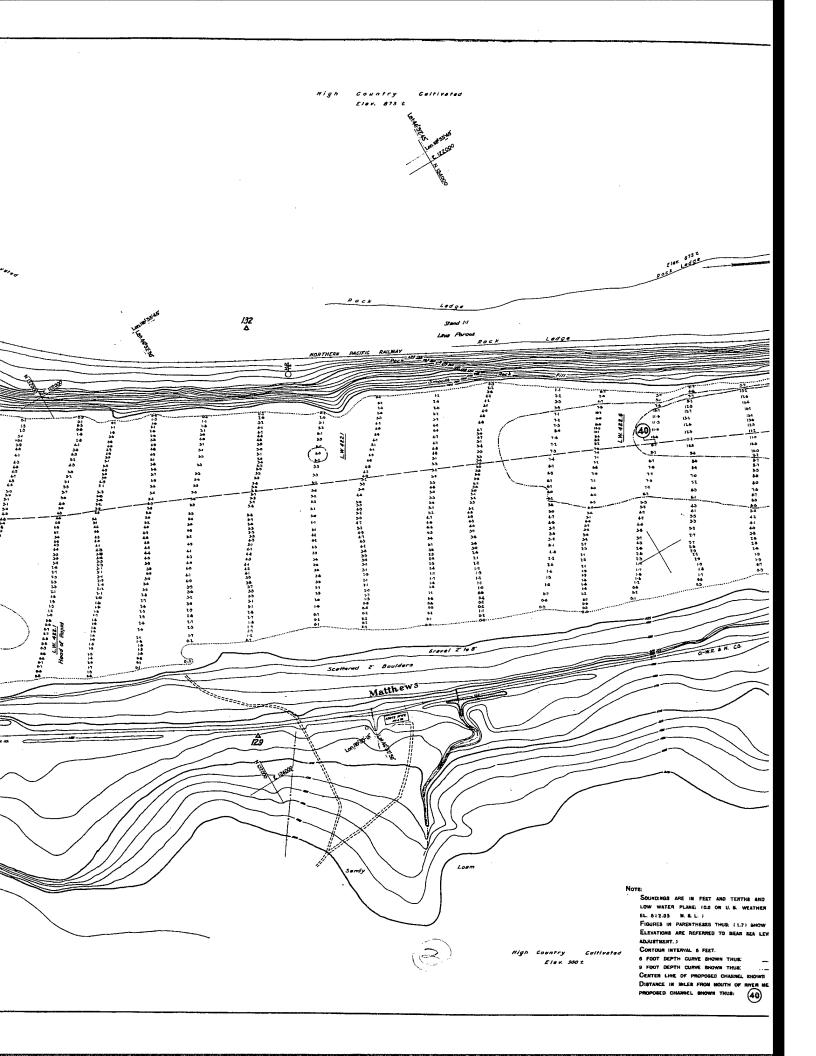


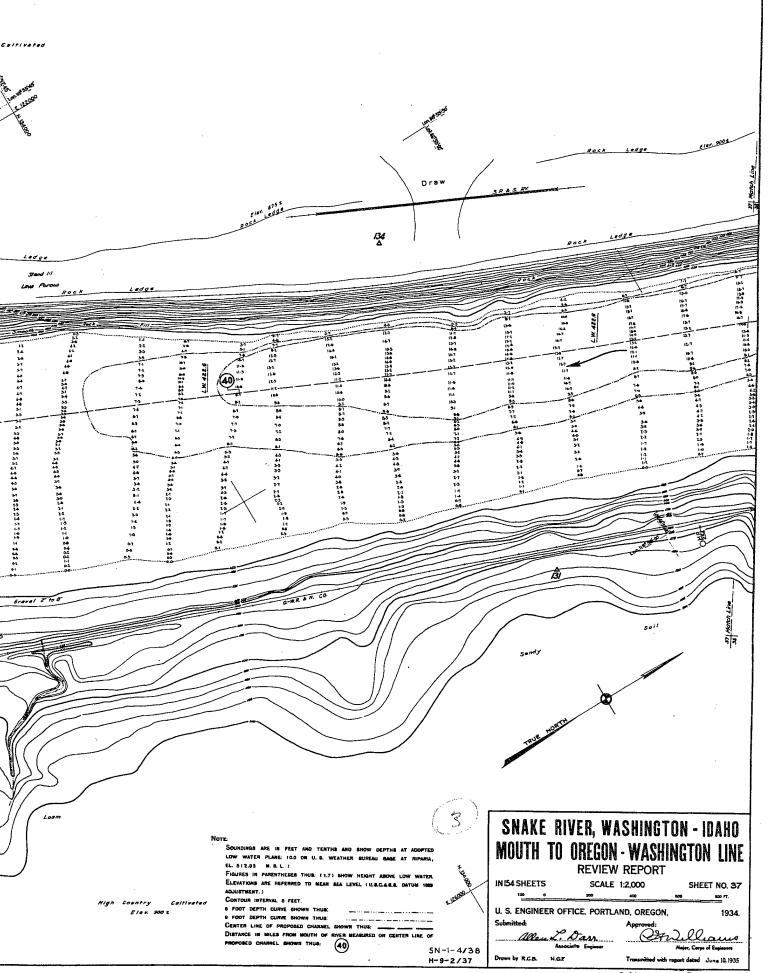


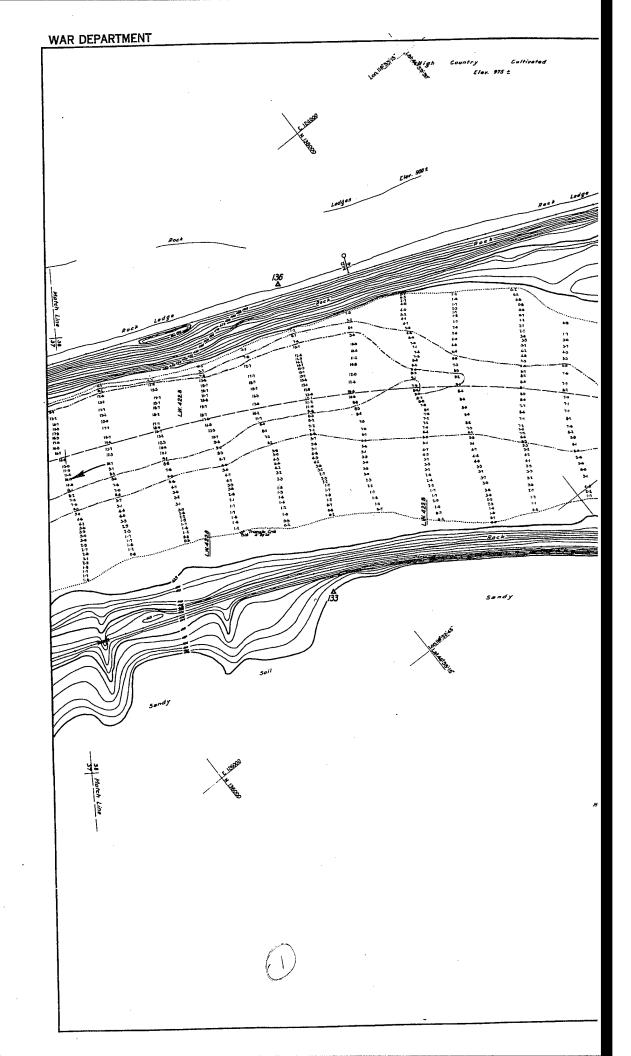


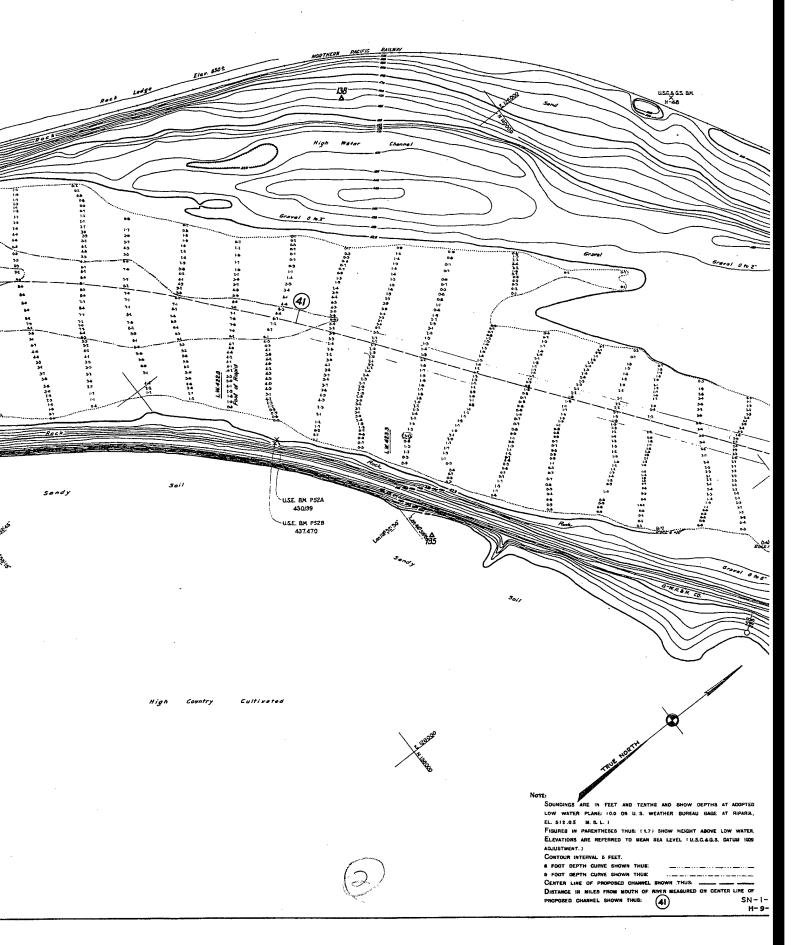


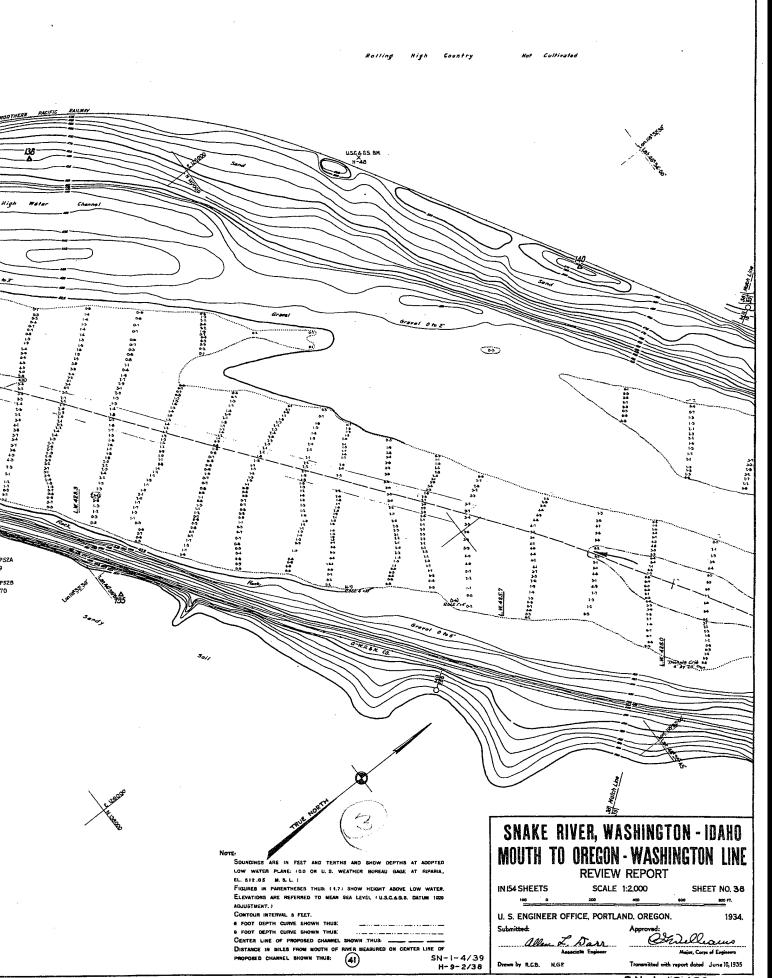


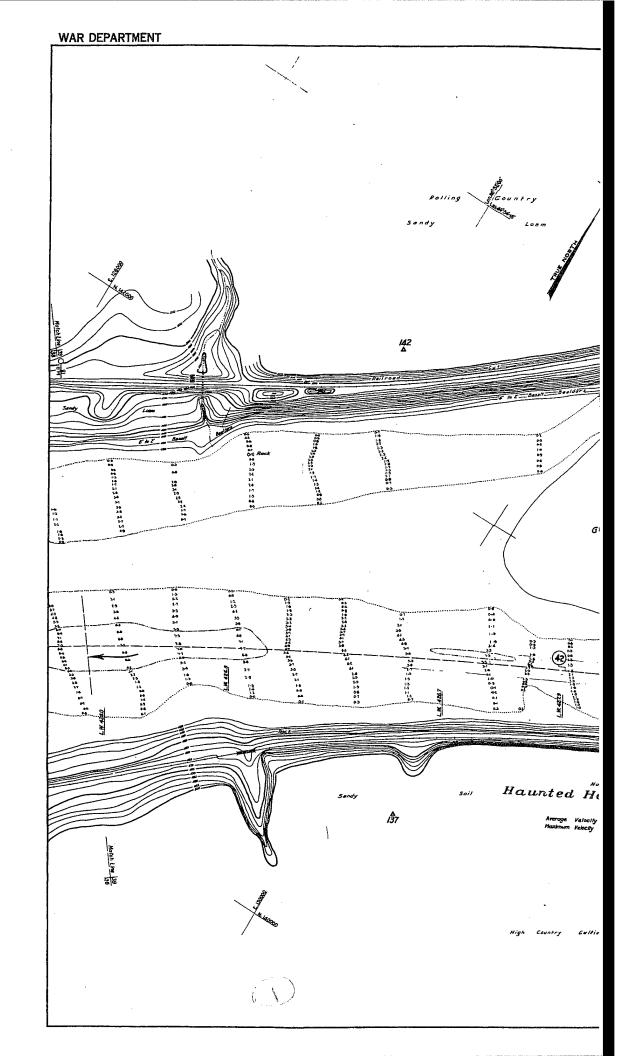


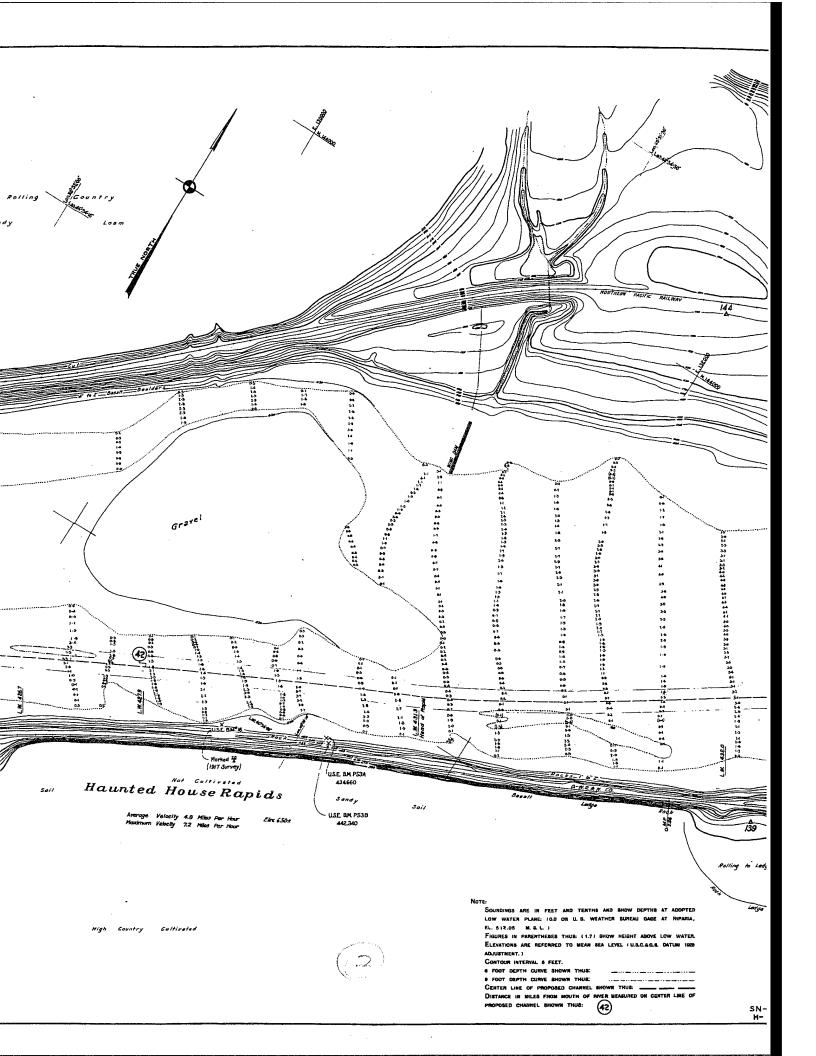


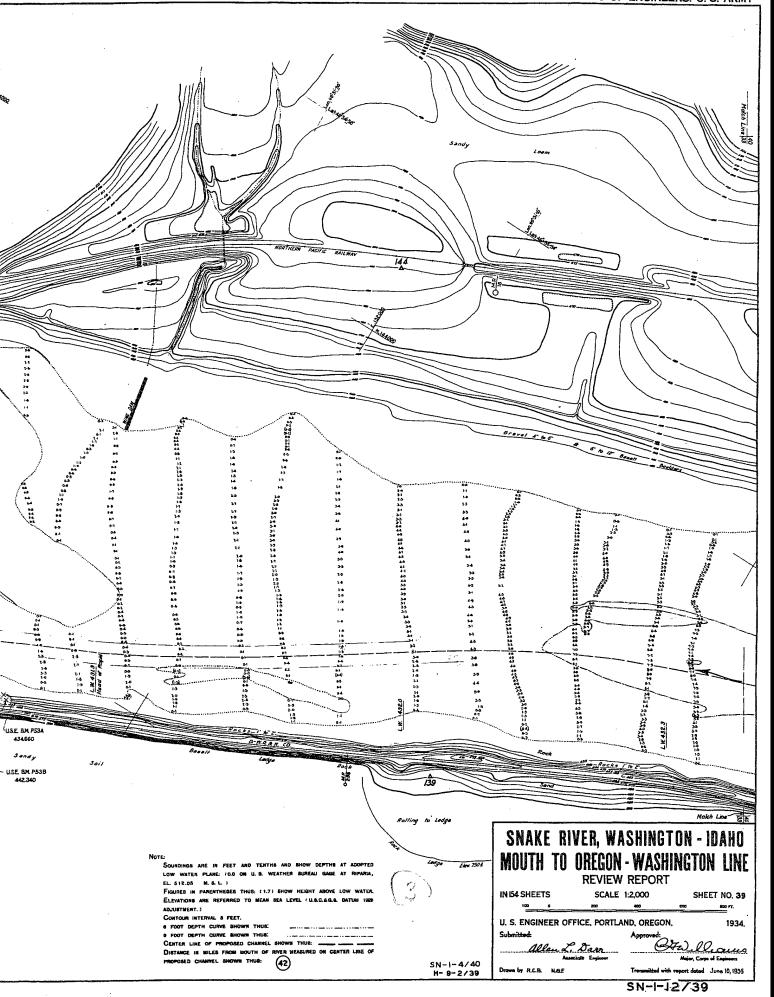


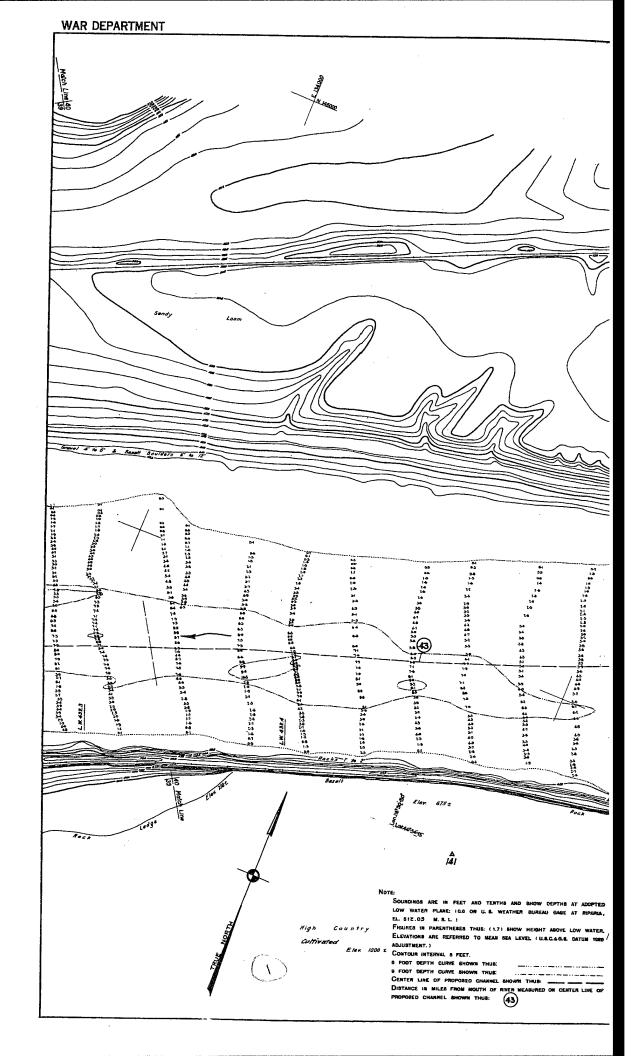


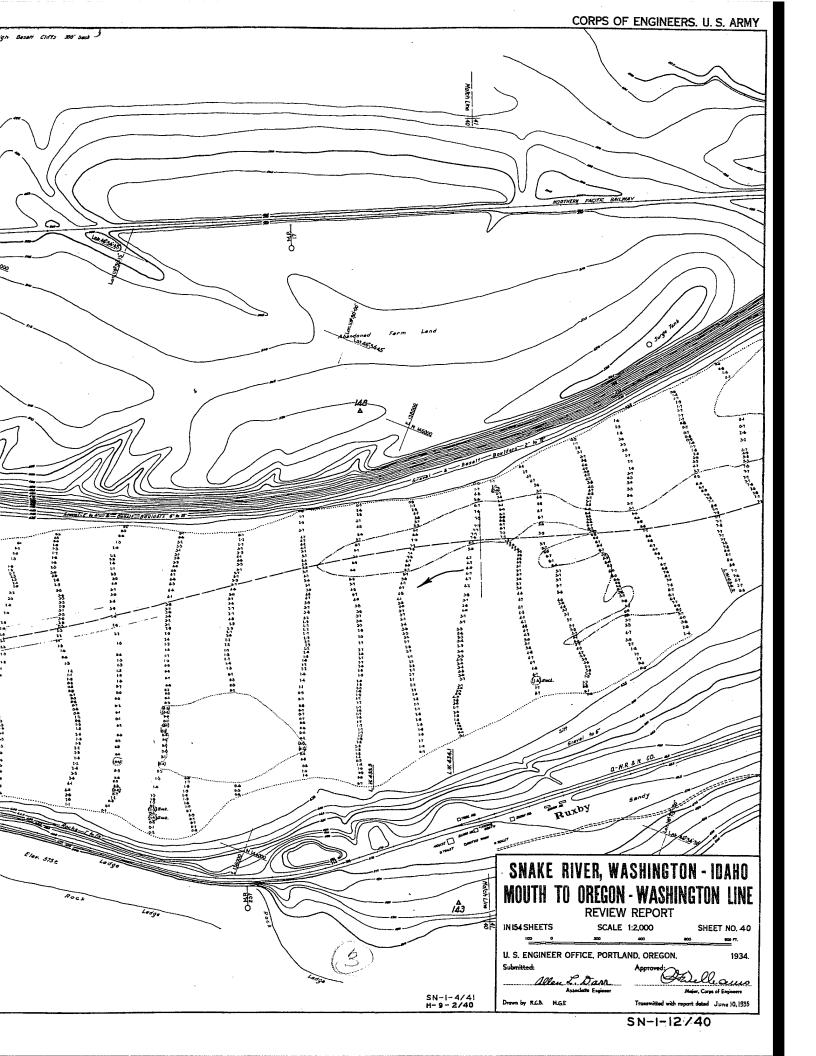


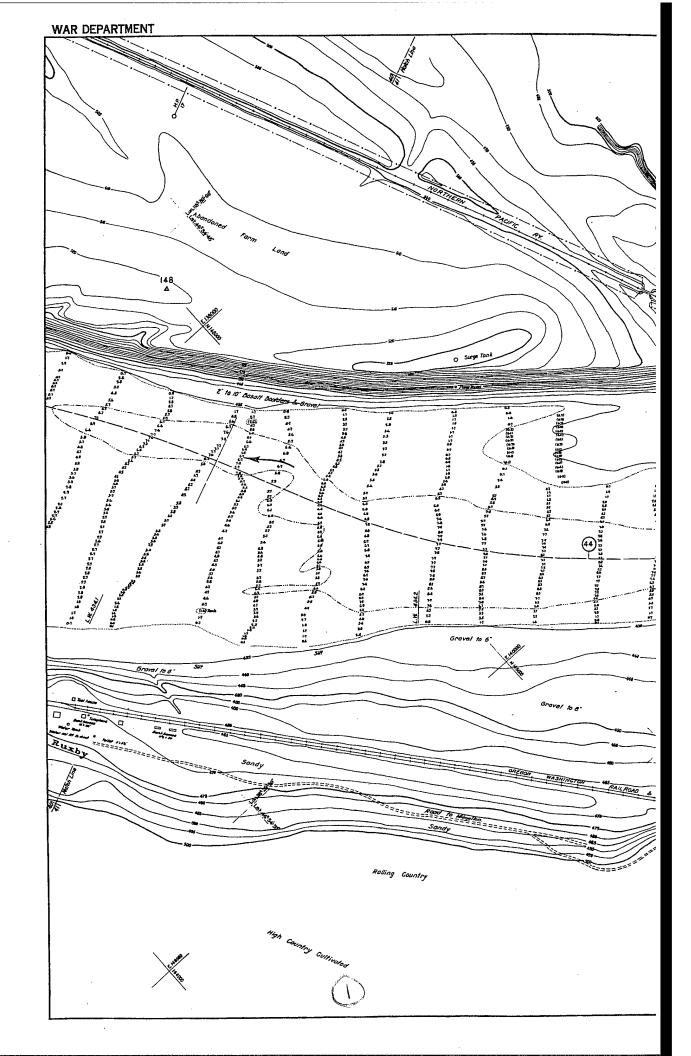


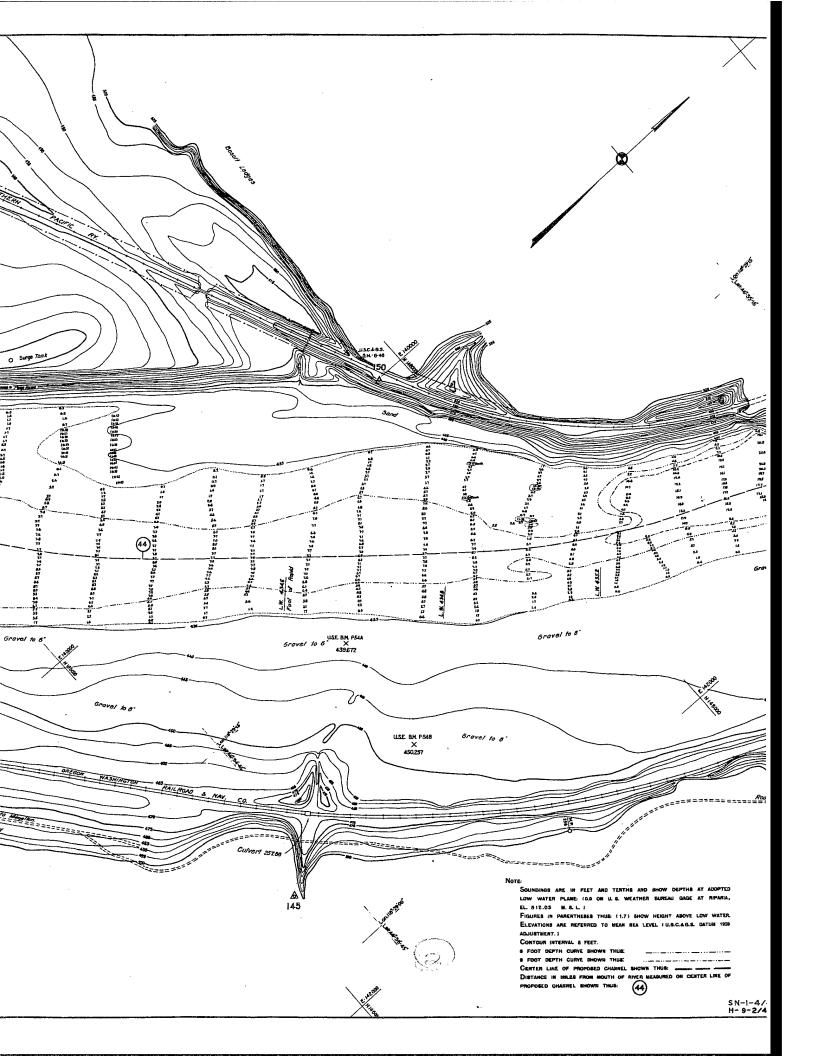


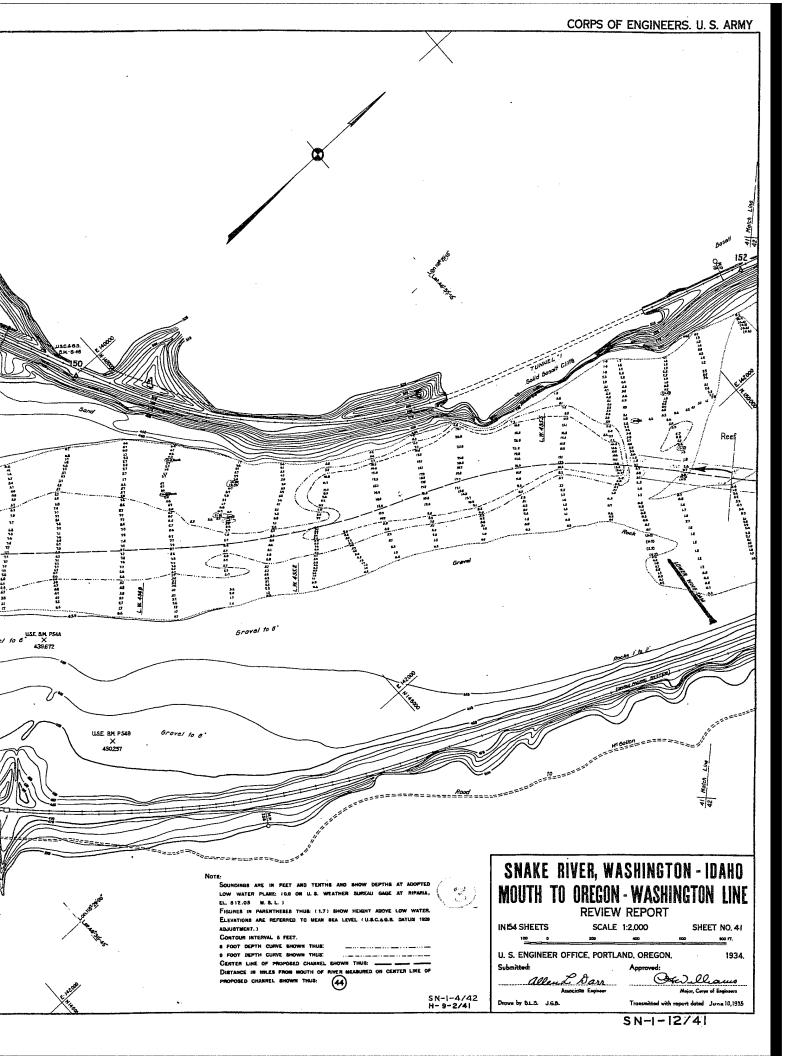


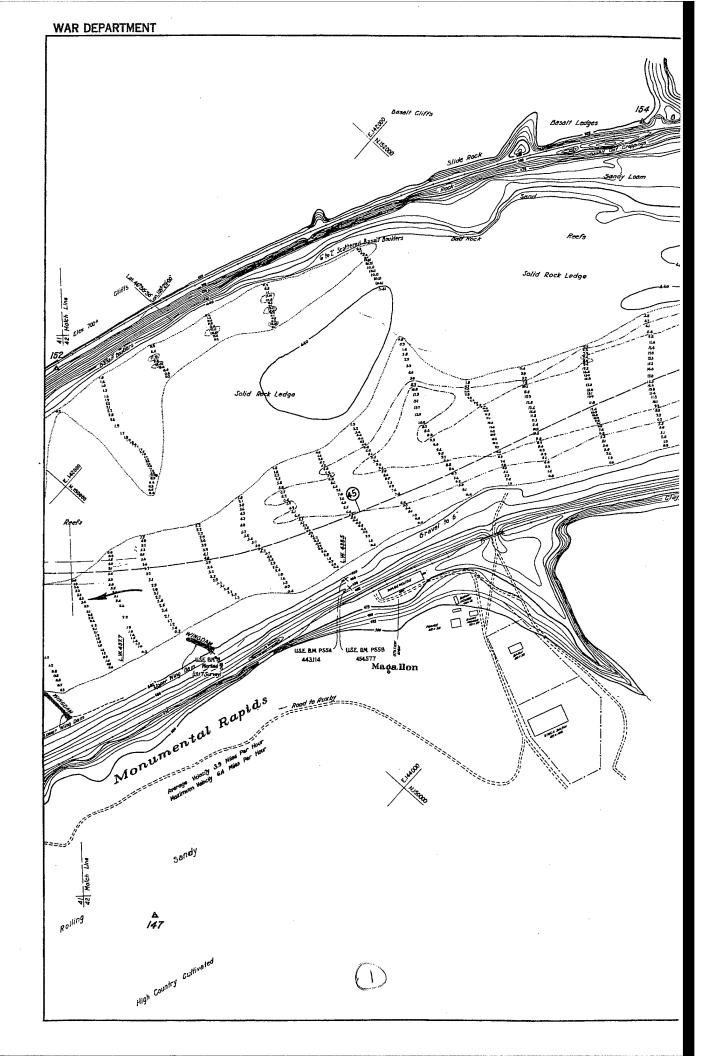


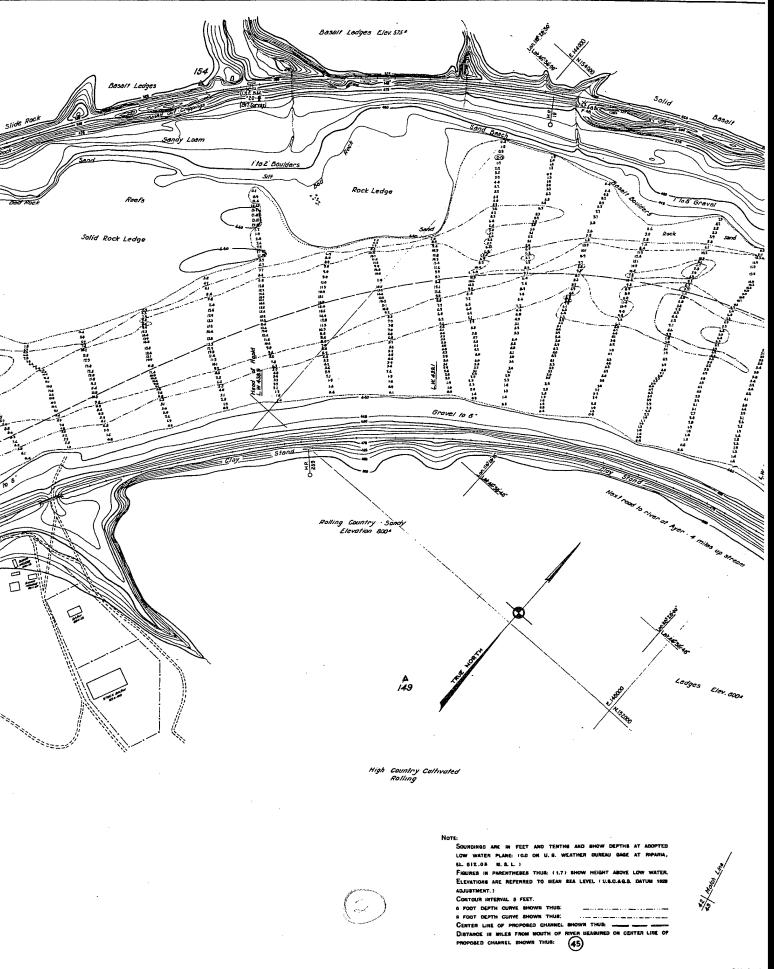


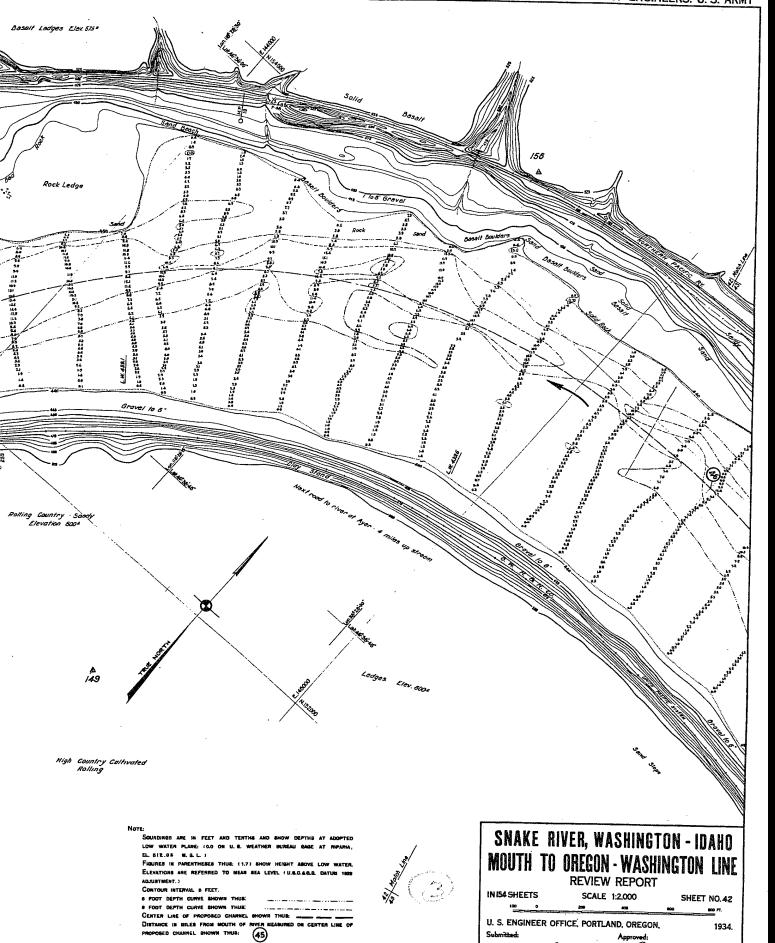








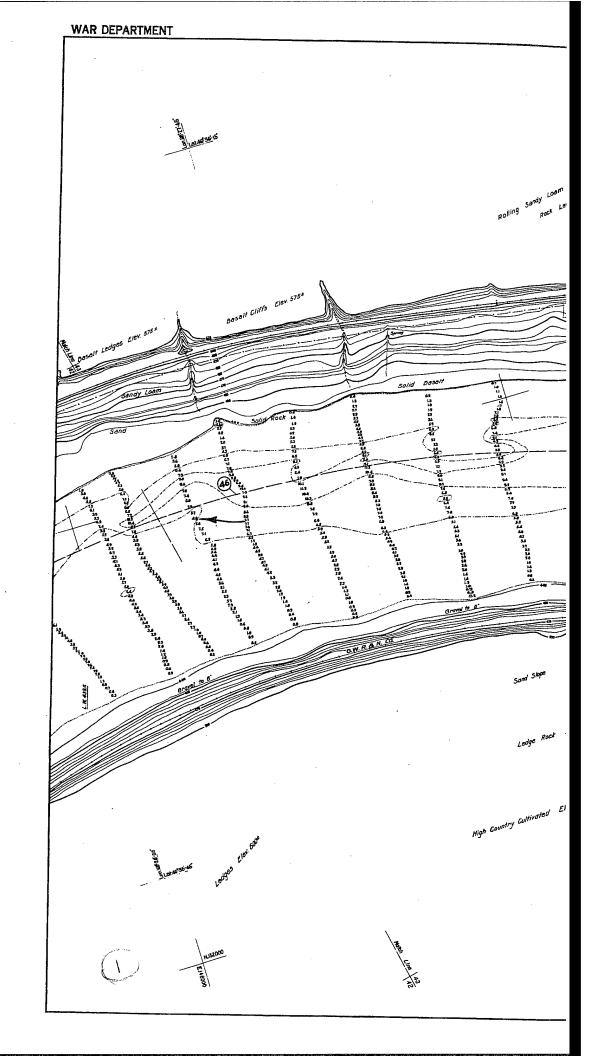


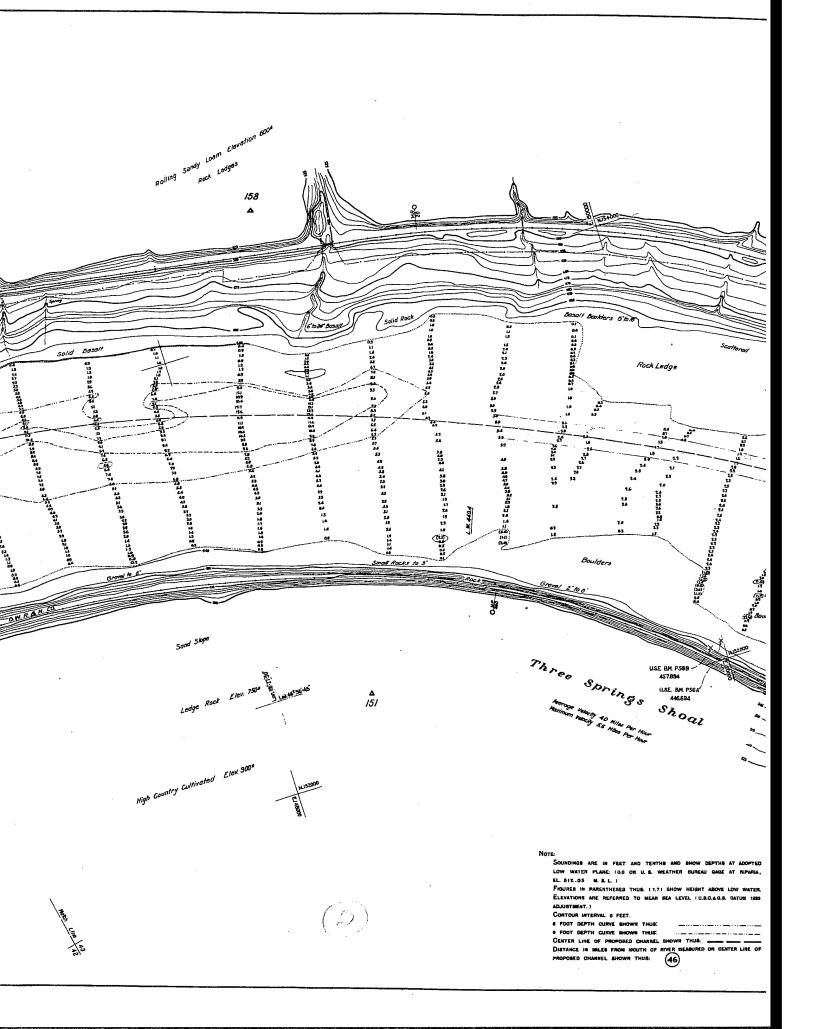


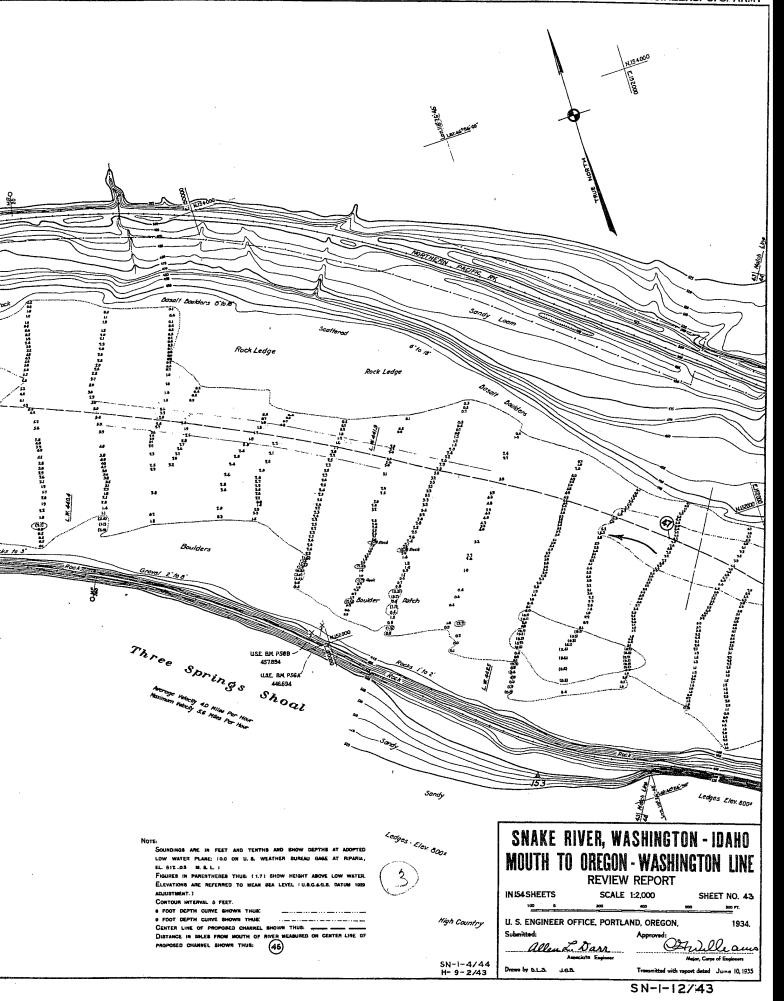
SN-1-12/42 ,

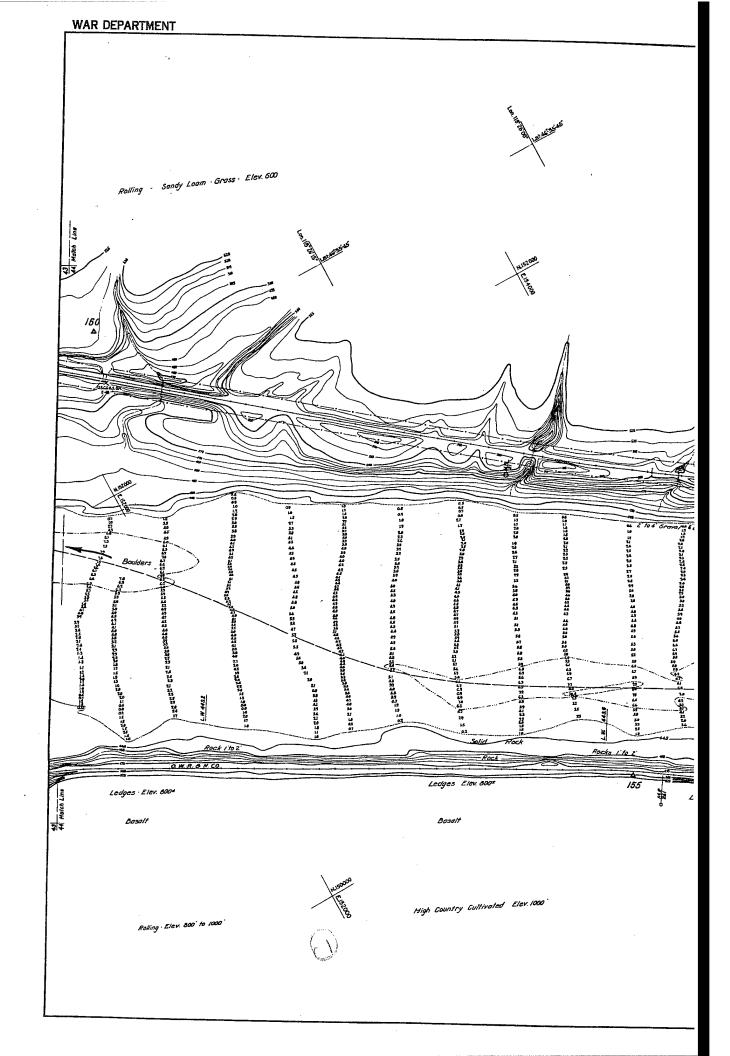
allen L. Darn

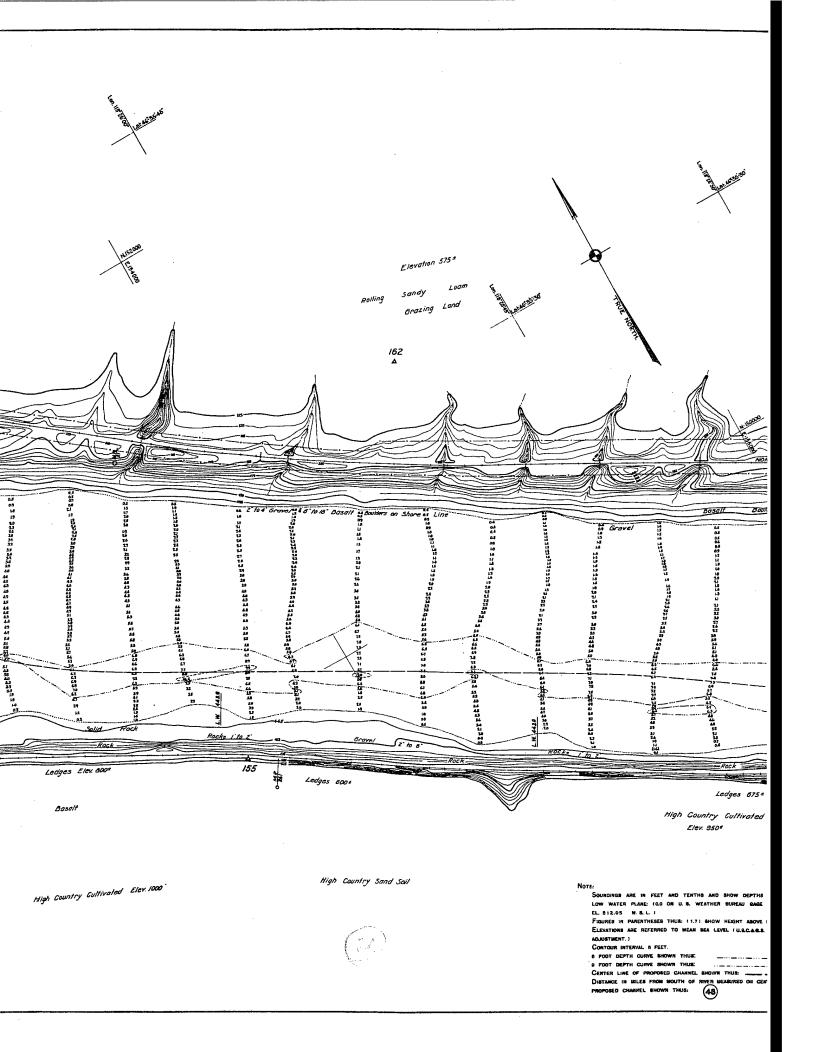
Drawn by D.L.S. JGB.

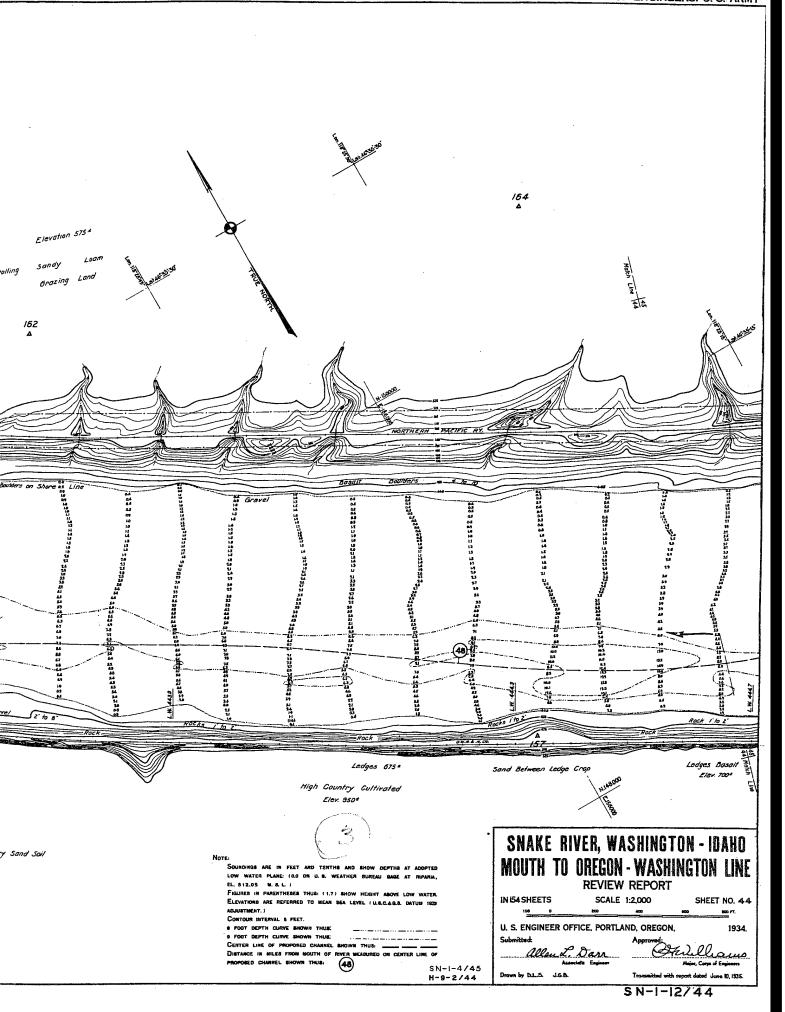


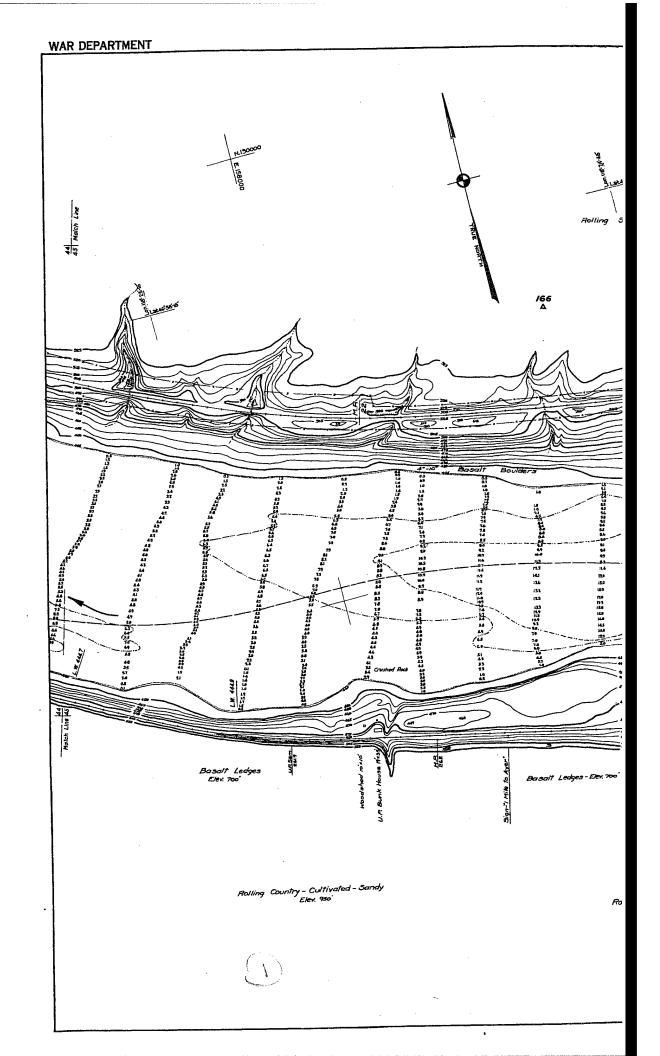


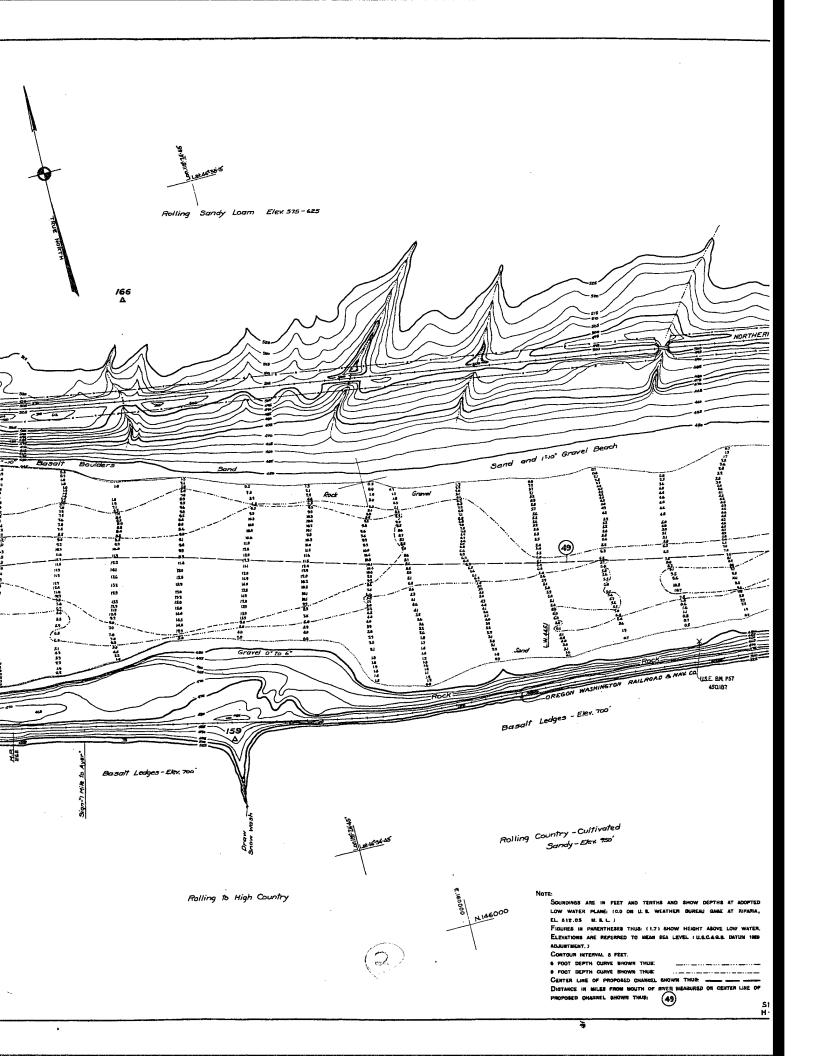


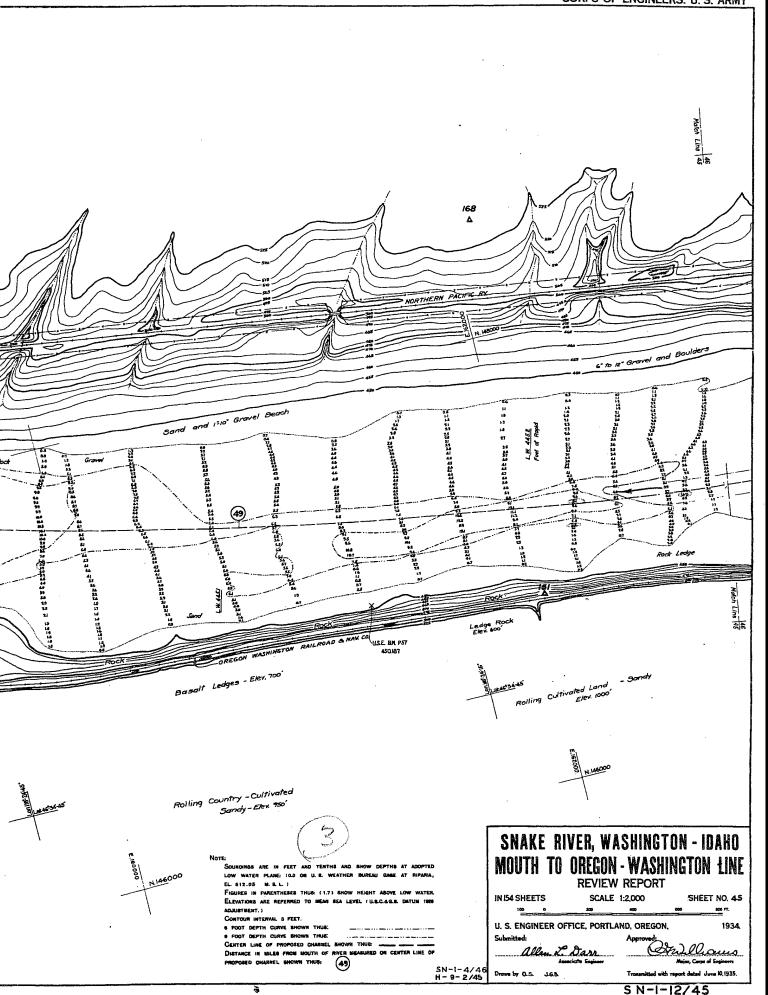


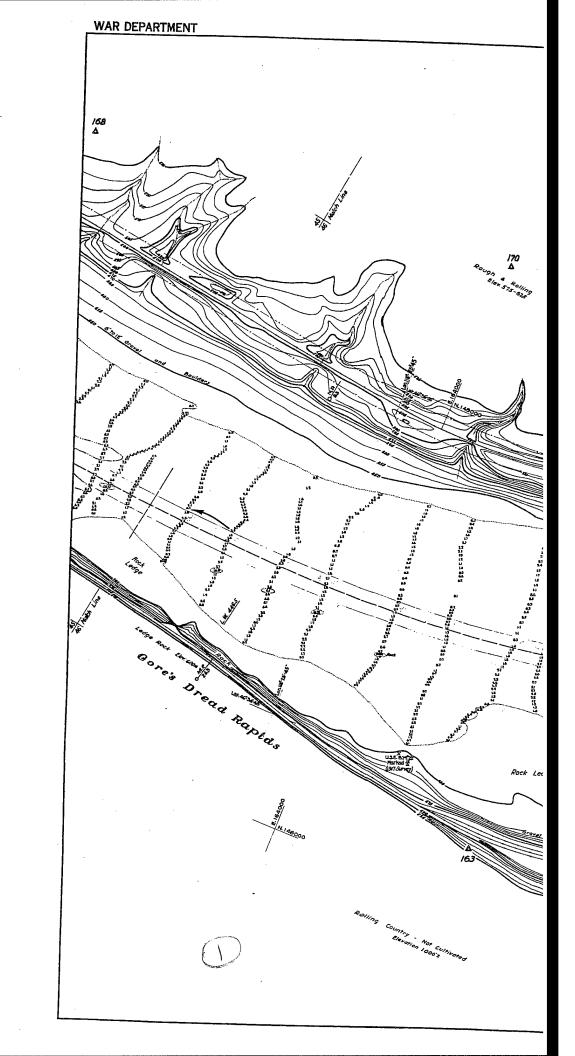


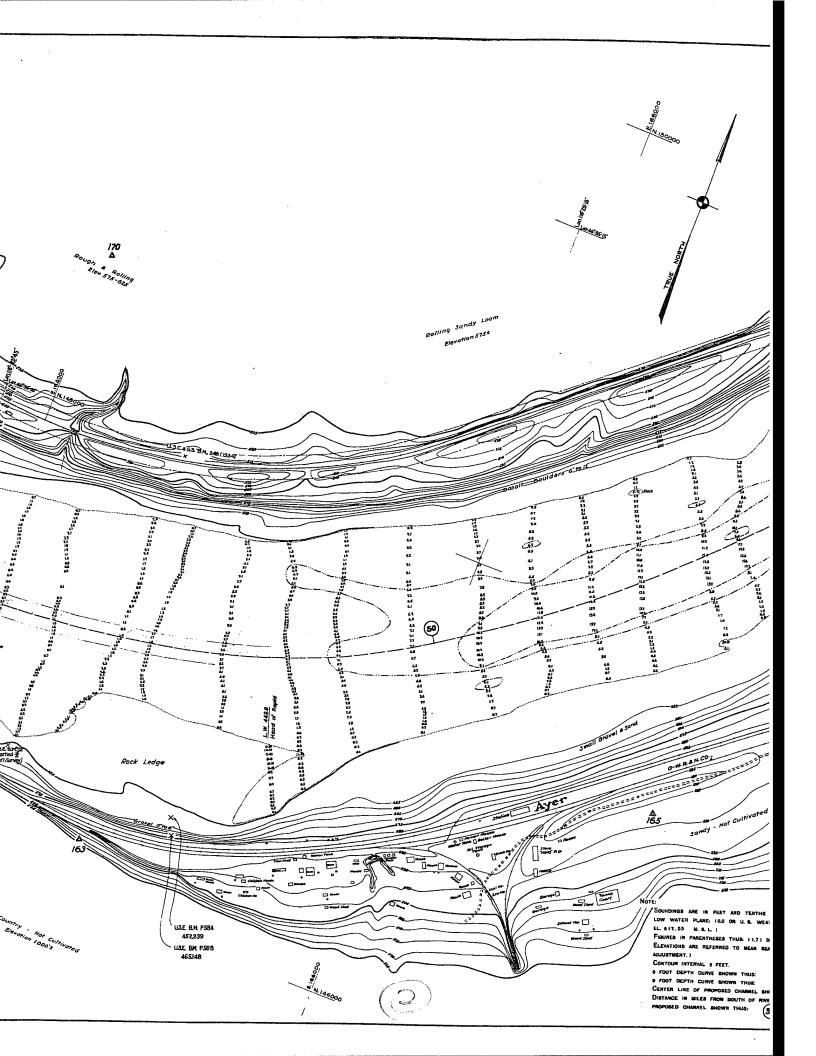


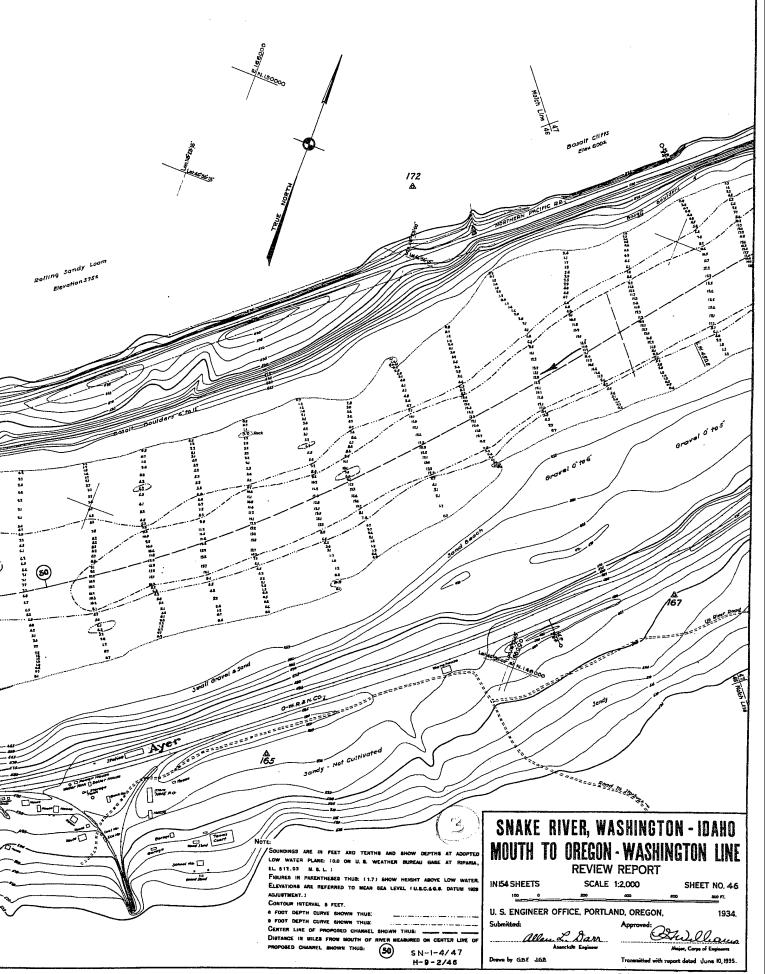


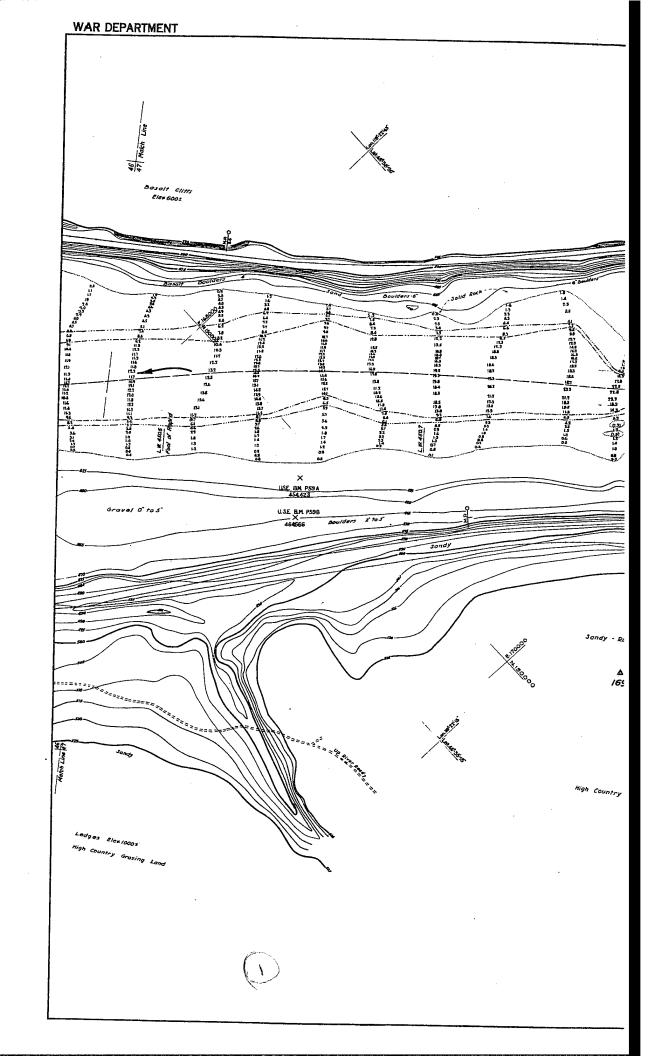


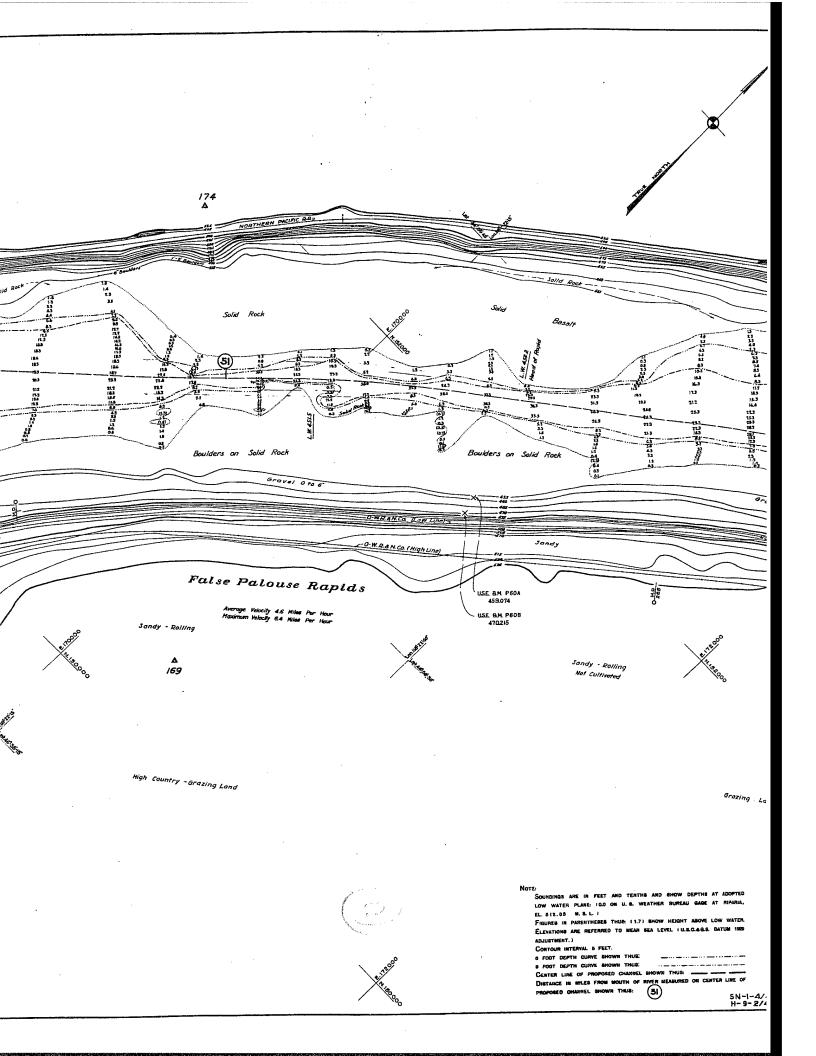


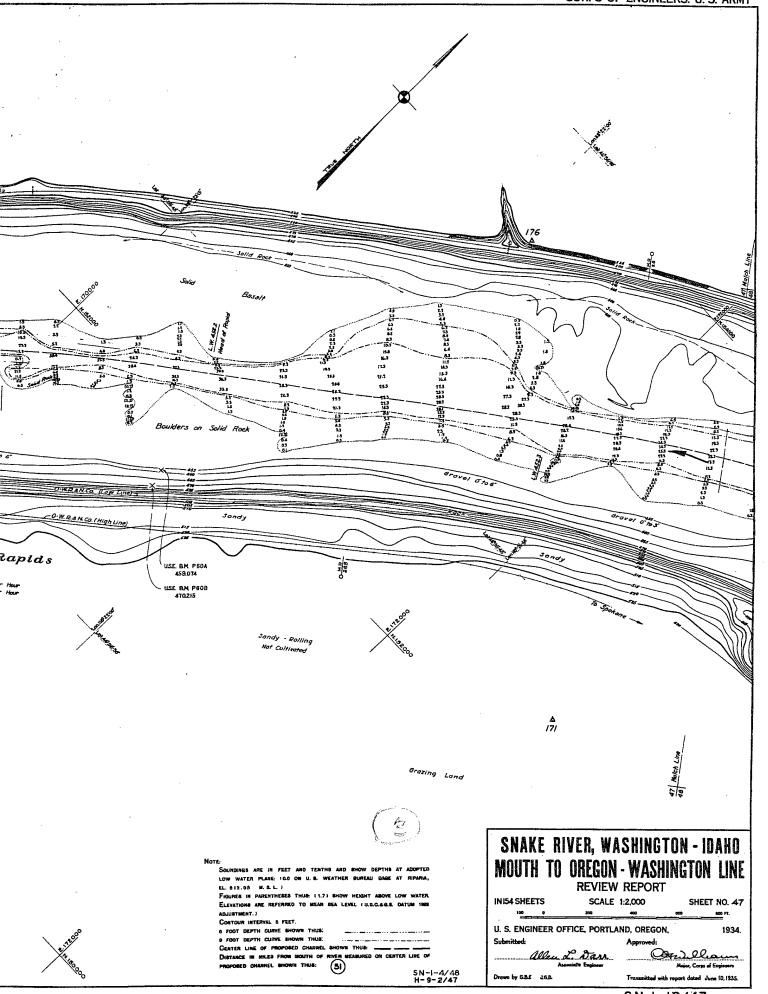


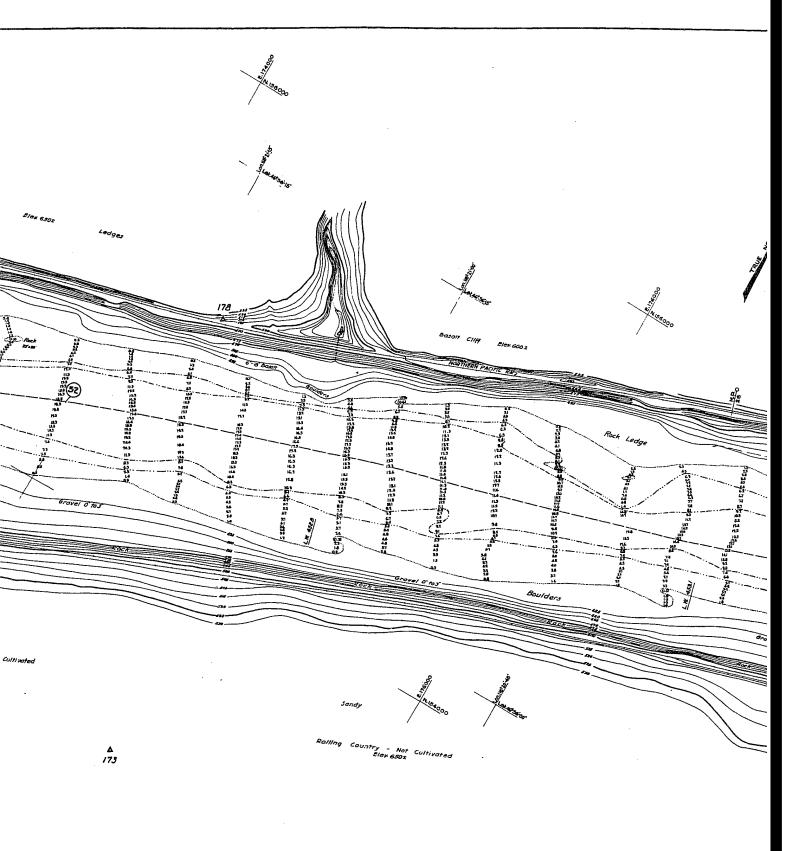












SOURINGS ARE IN PERT AND TESTING AND SHOW DEPTHS AT ADOPTED LOW WATER PLANE (10.0 OR U.S. WEATHER SUREAU GASE AT RIPARIA, EL. 512,08 MLS.L.)
FIGURES IN PARENTHEESS THUS: (1.7) SHOW HEIGHT ABOVE LOW WATER.
ELEVATIONS ARE REFERRED TO SEAR SEA LEYEL (U.S.C.6.S. DATUM 1029

ADJUSTMENT,)
CONTOUR INTERVAL & FEET.

CONTOUR INTERVAL & FEXT.

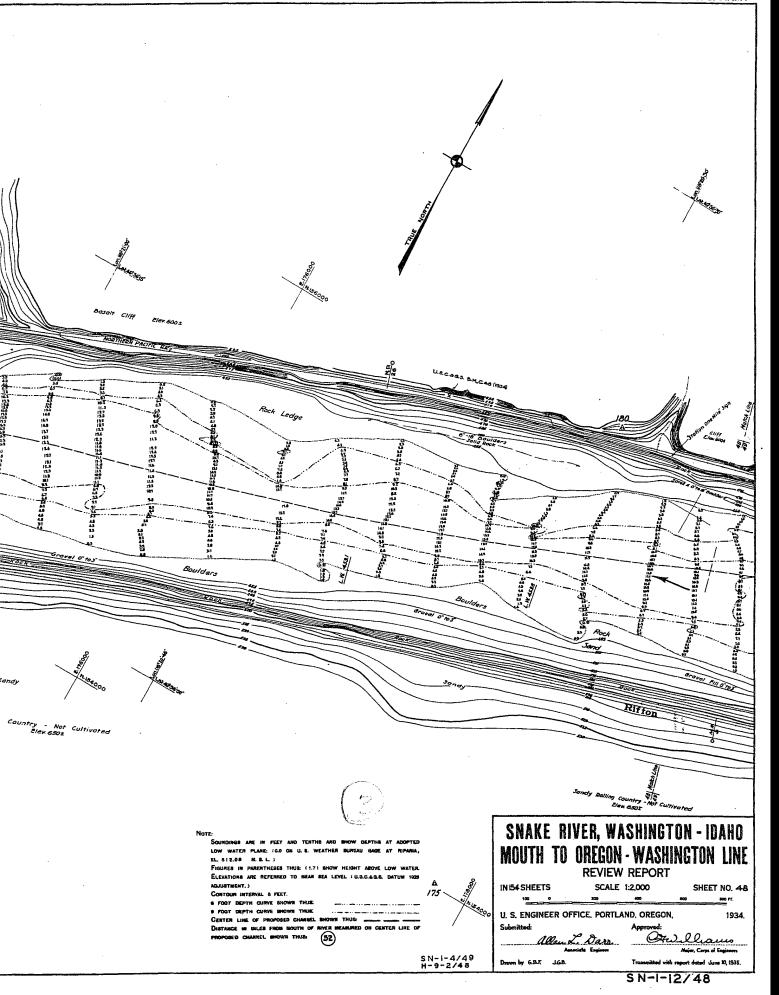
6 FOOD DEPTH CHIVE SHOWN THUS:

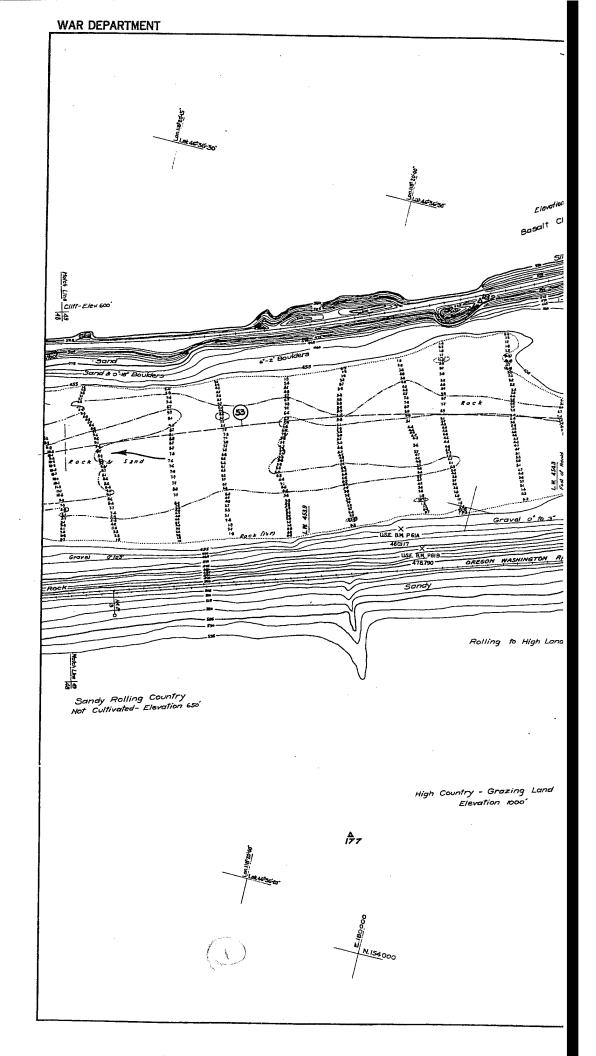
6 FOOD DEPTH CHIVE SHOWN THUS:

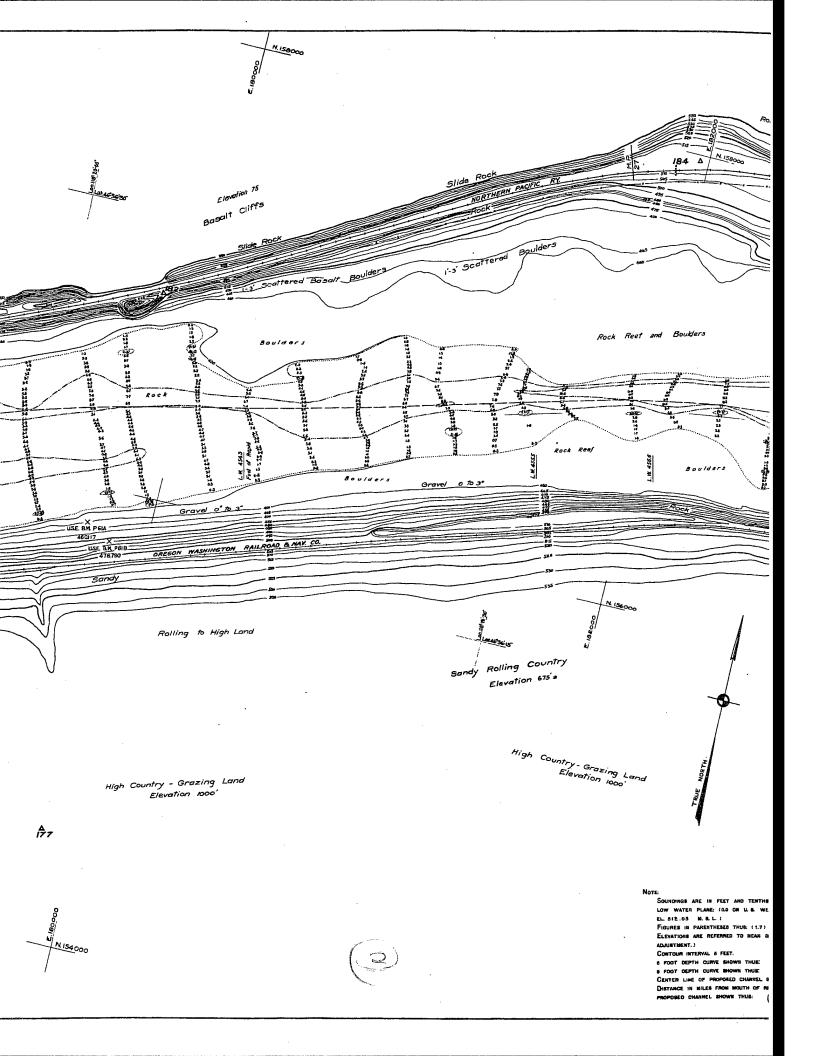
CENTER LINE OF PROPOSED CHAMBEL SHOWN THUS:

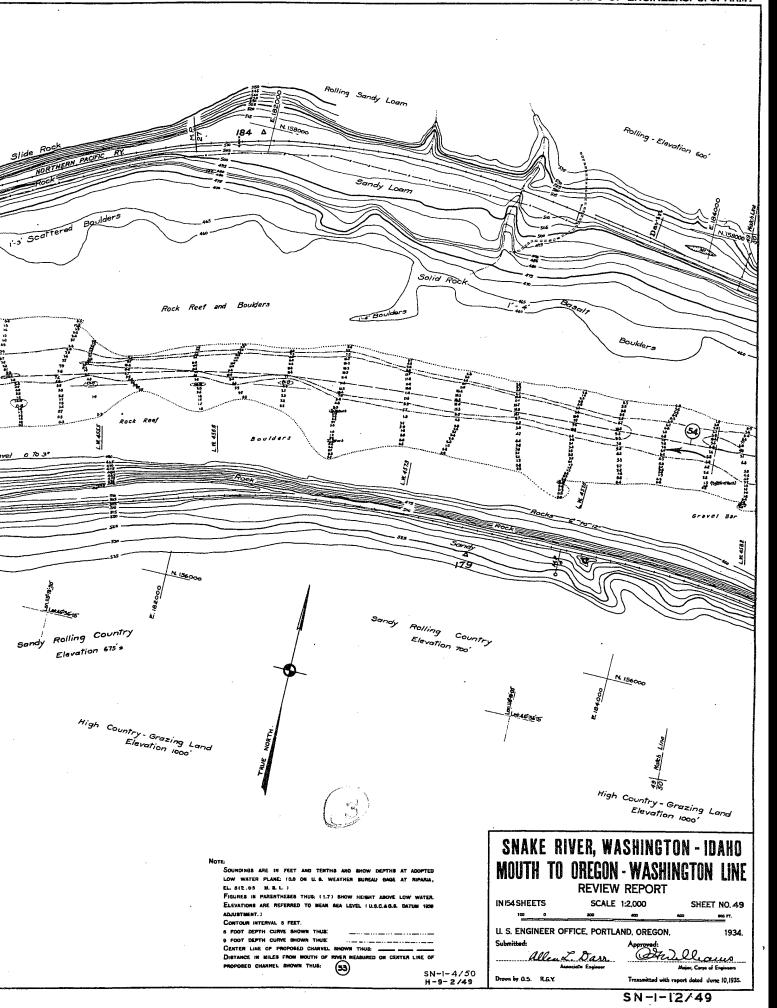
DISTANCE IN INLES FROM BOUTH OF RIVER MEASURED ON CENTER LINE OF PROPOSED CHARREL SHOWN THUS:

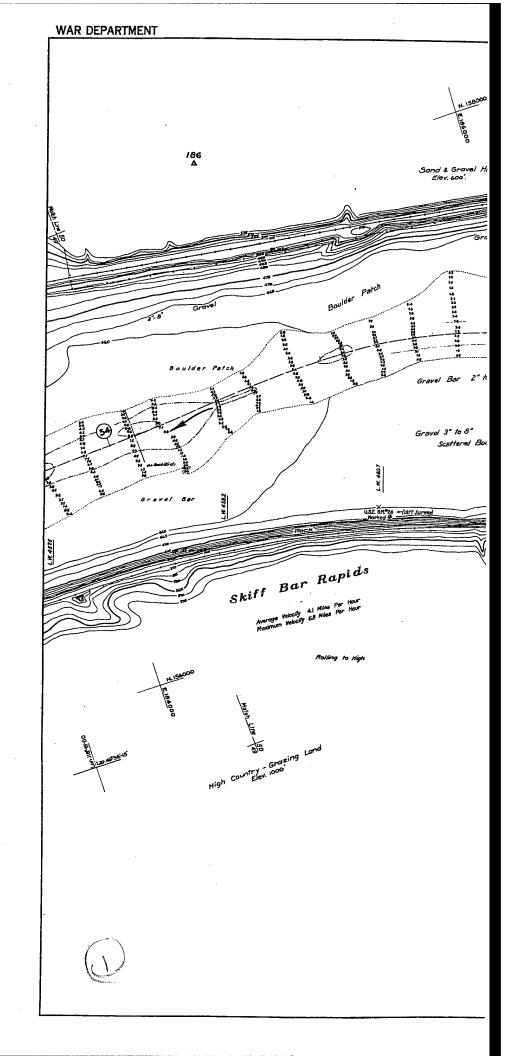
(52)

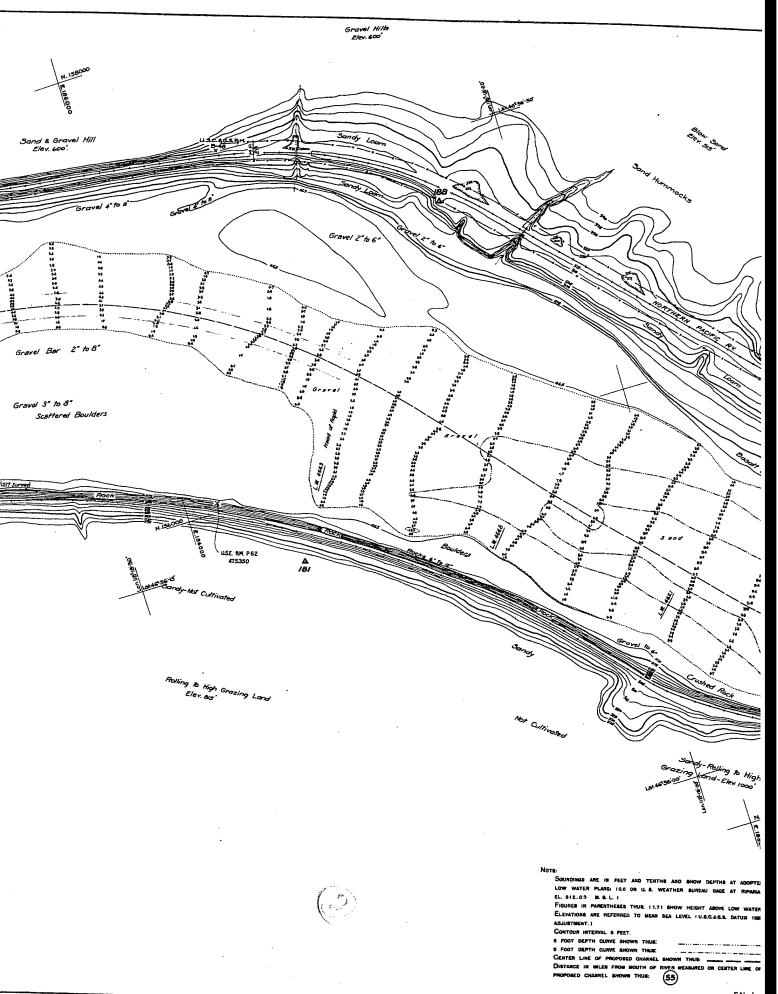


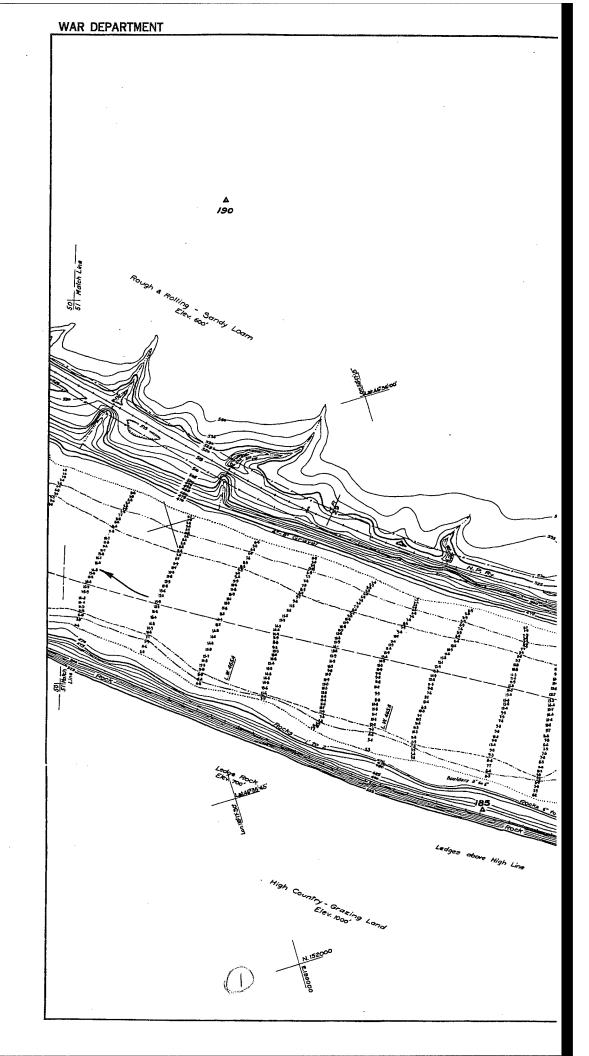


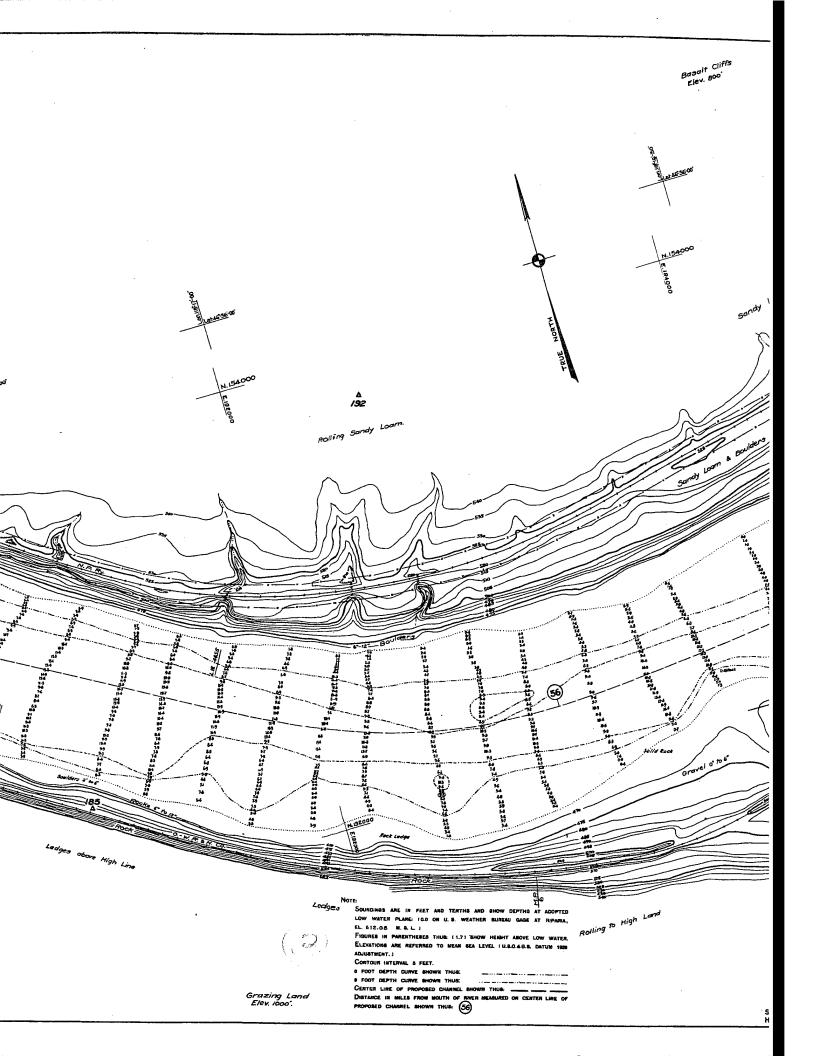


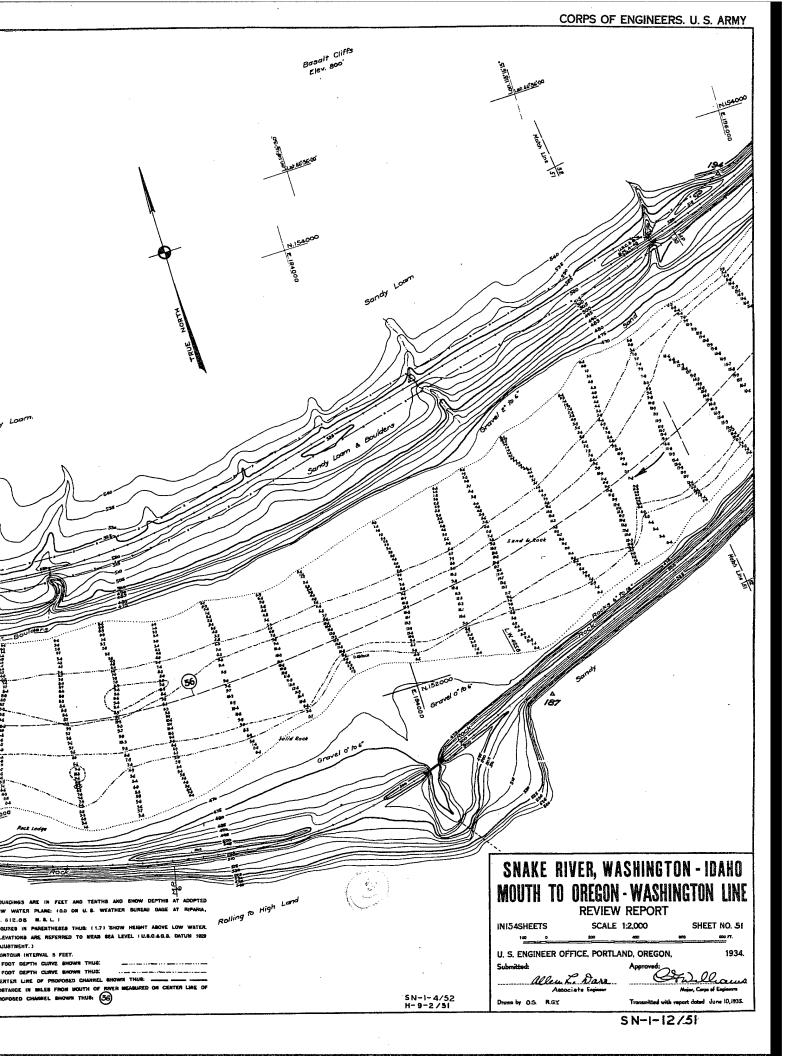


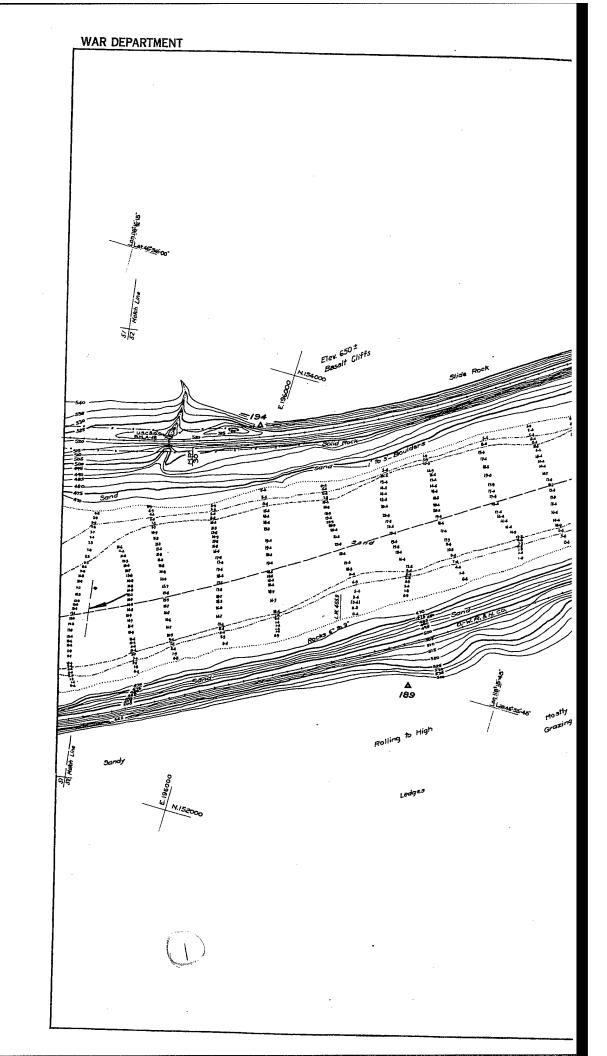


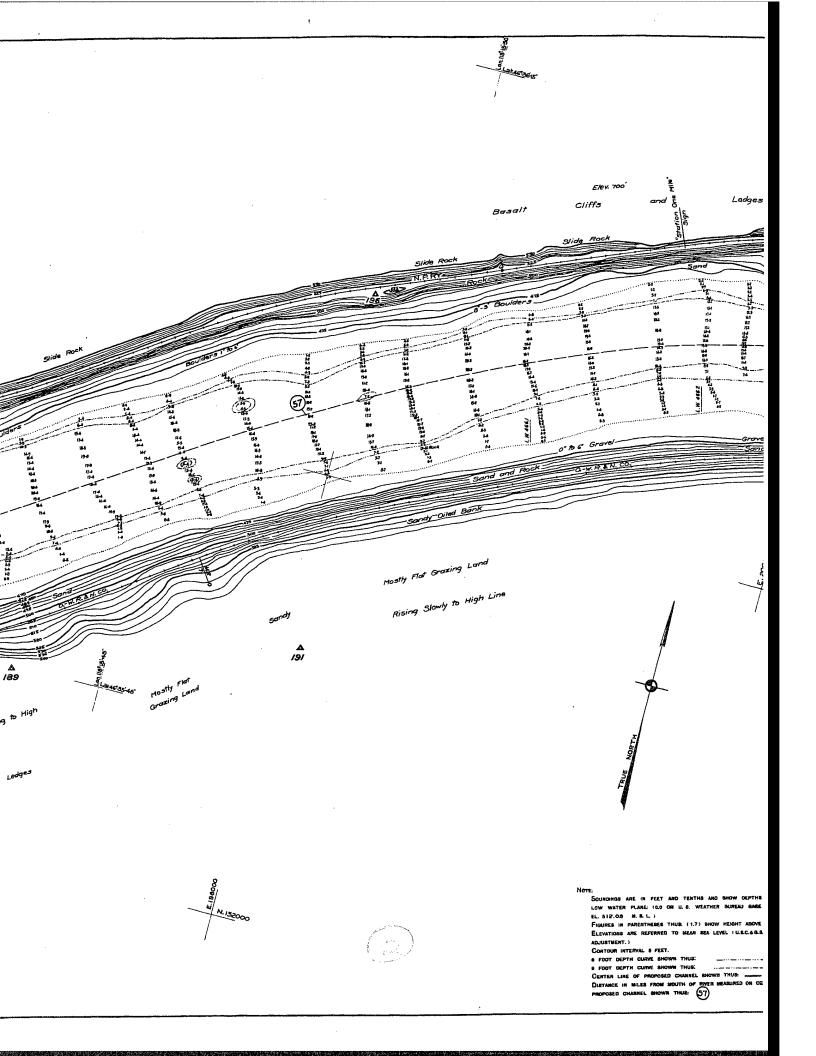






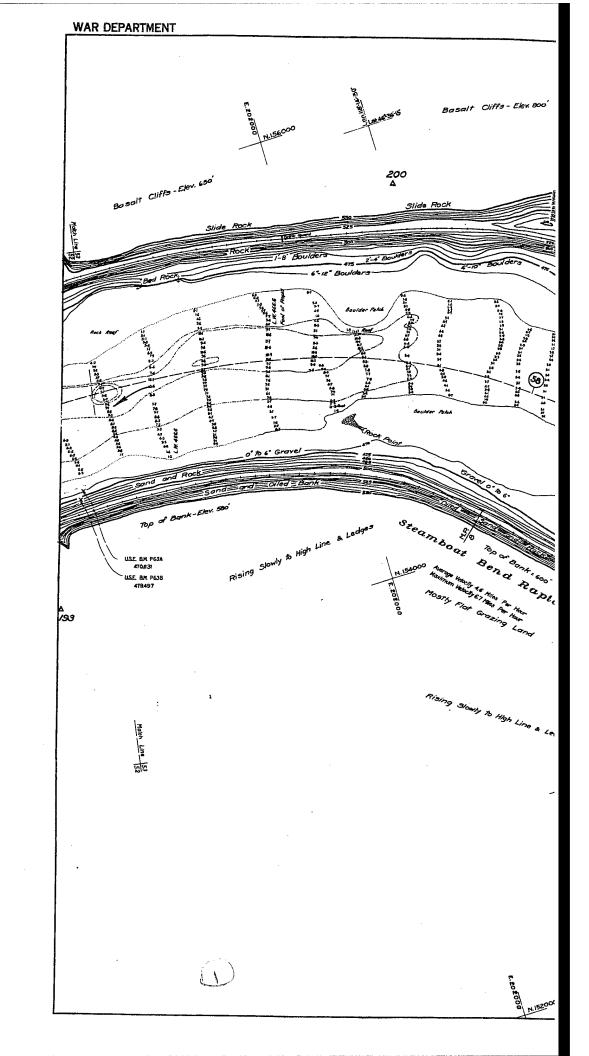


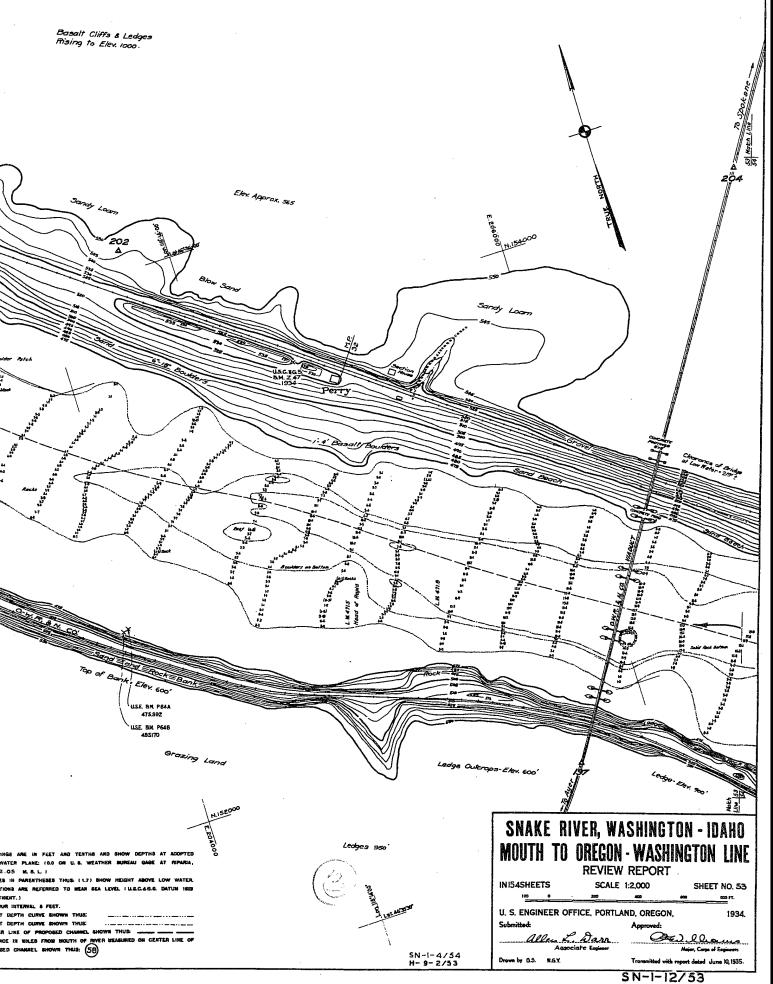


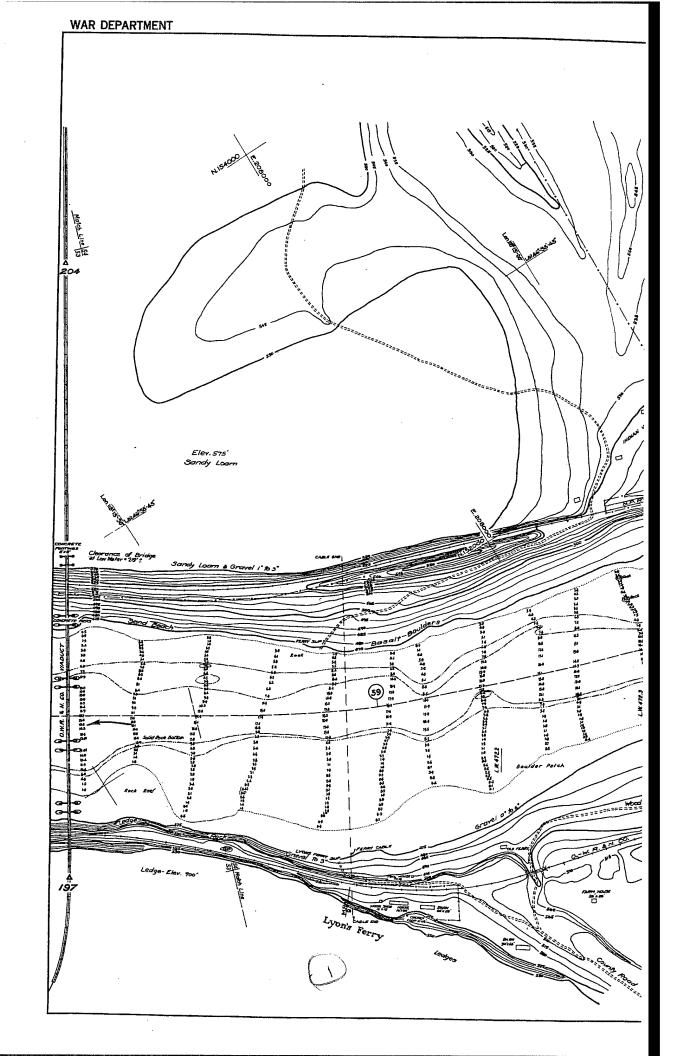


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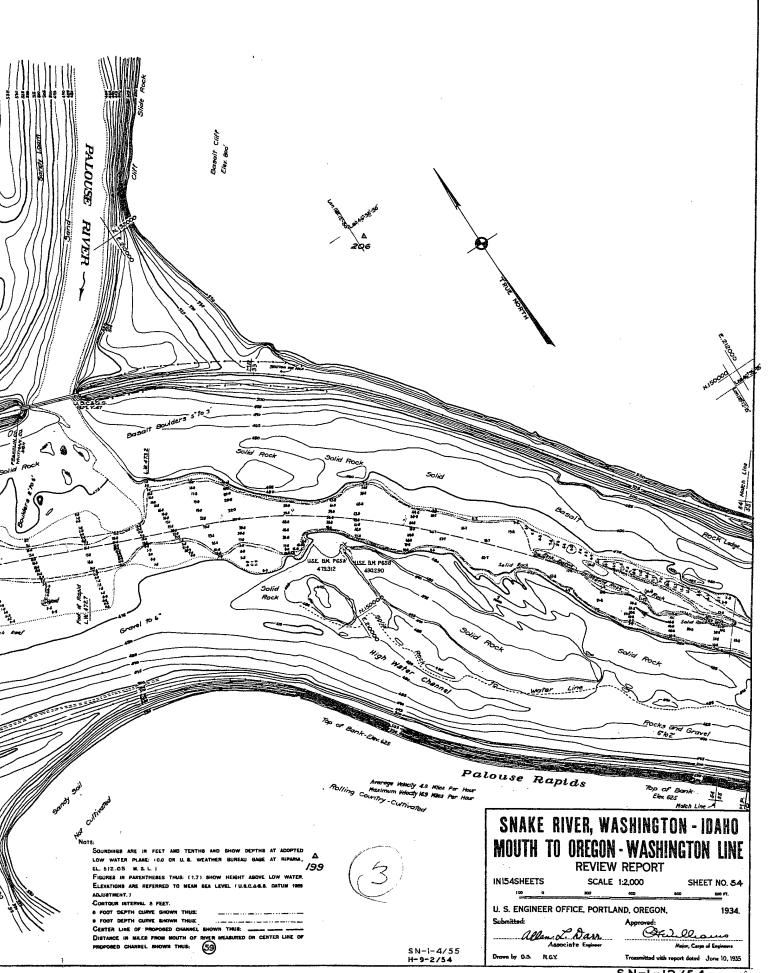
Drawn by O.S. R.G.Y

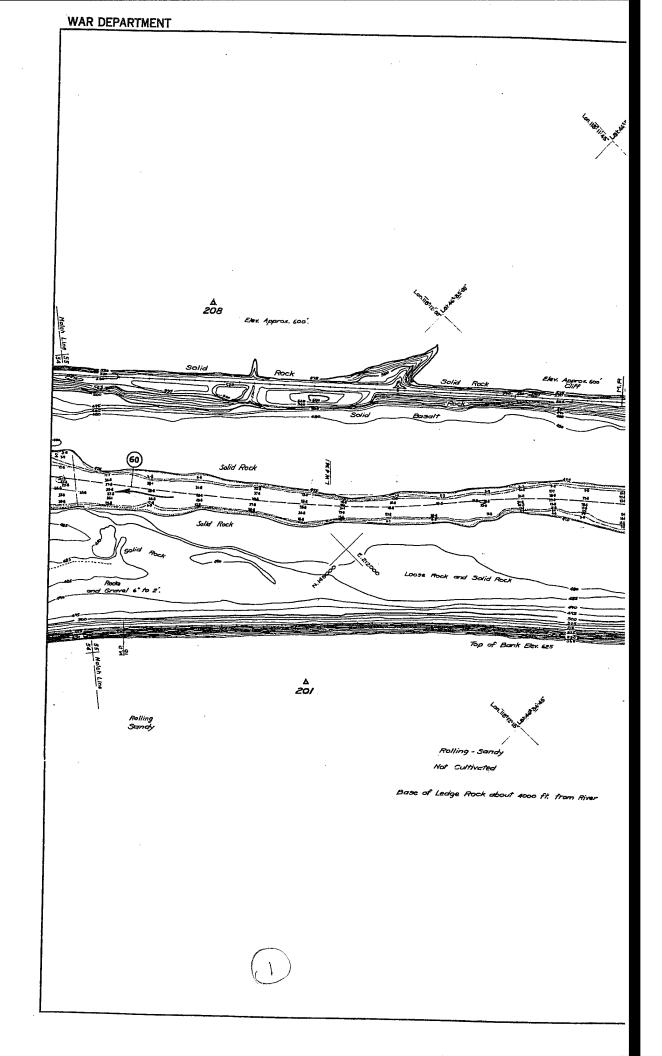


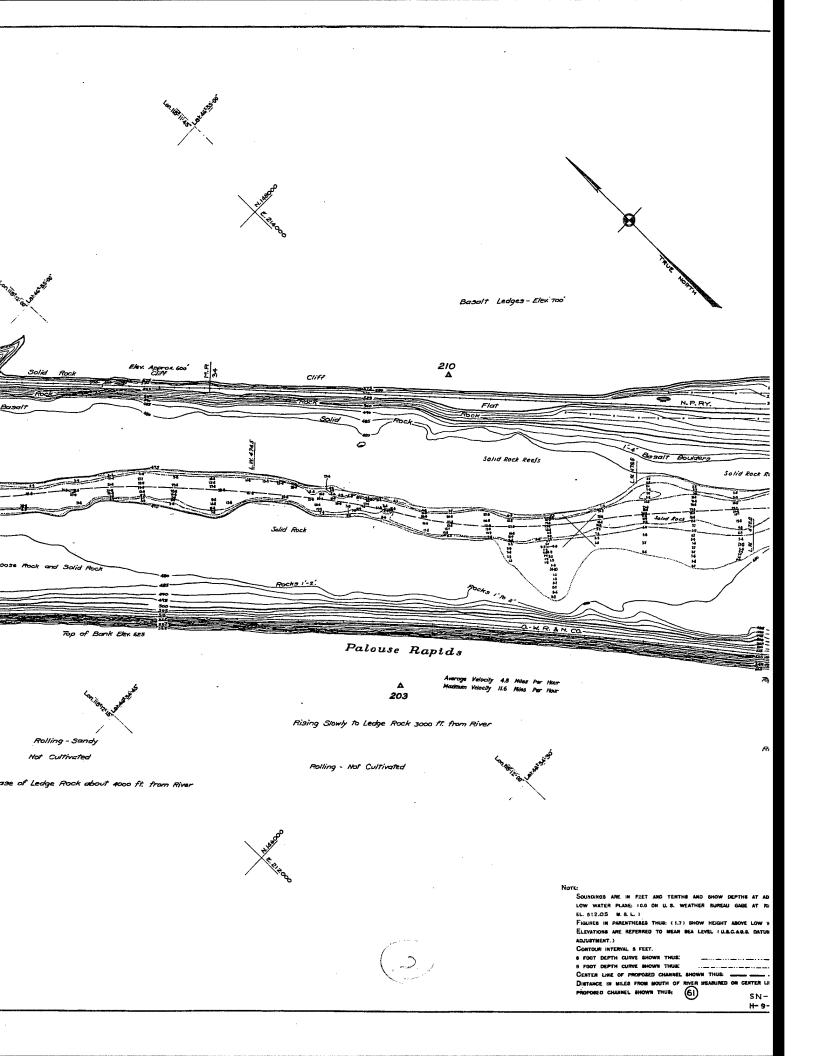


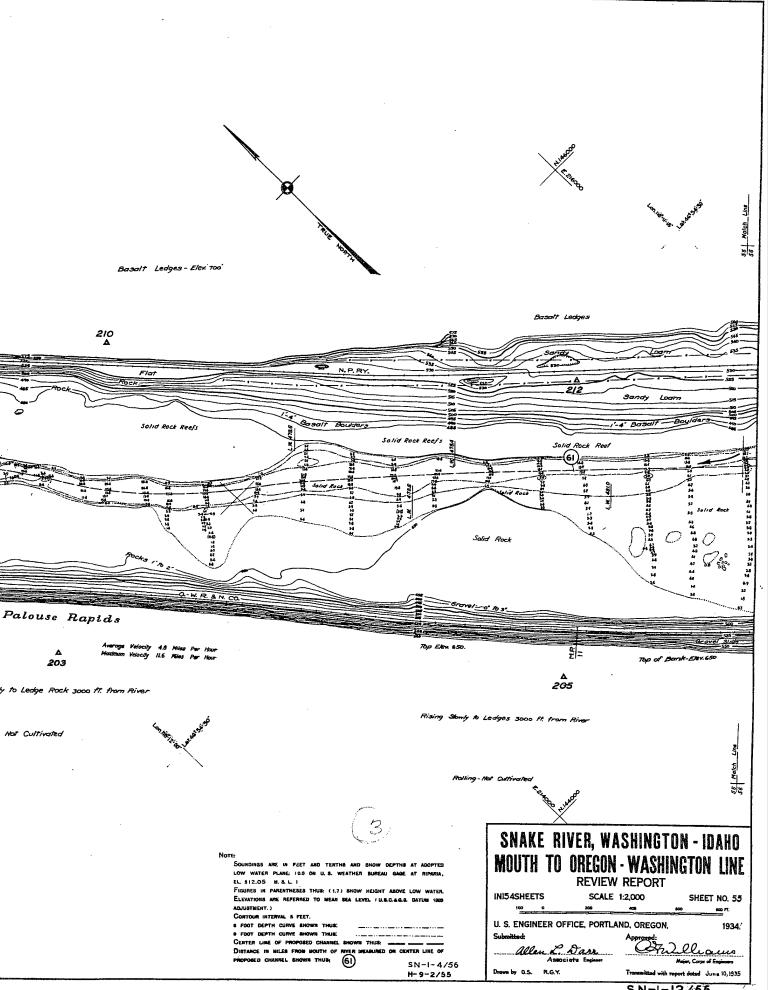


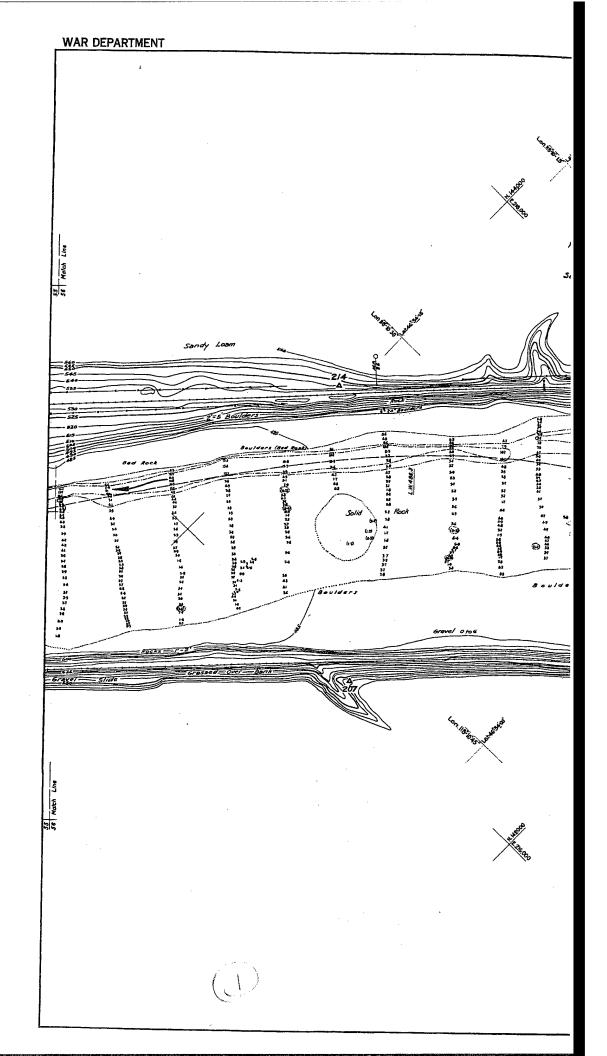


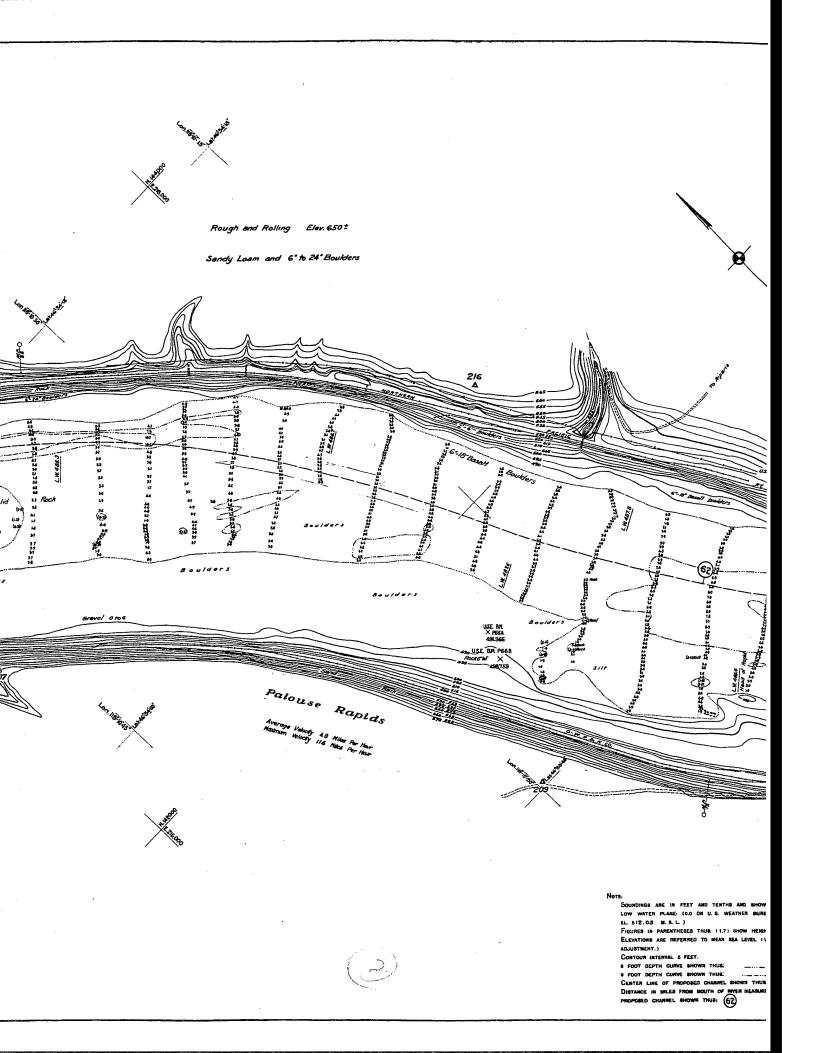


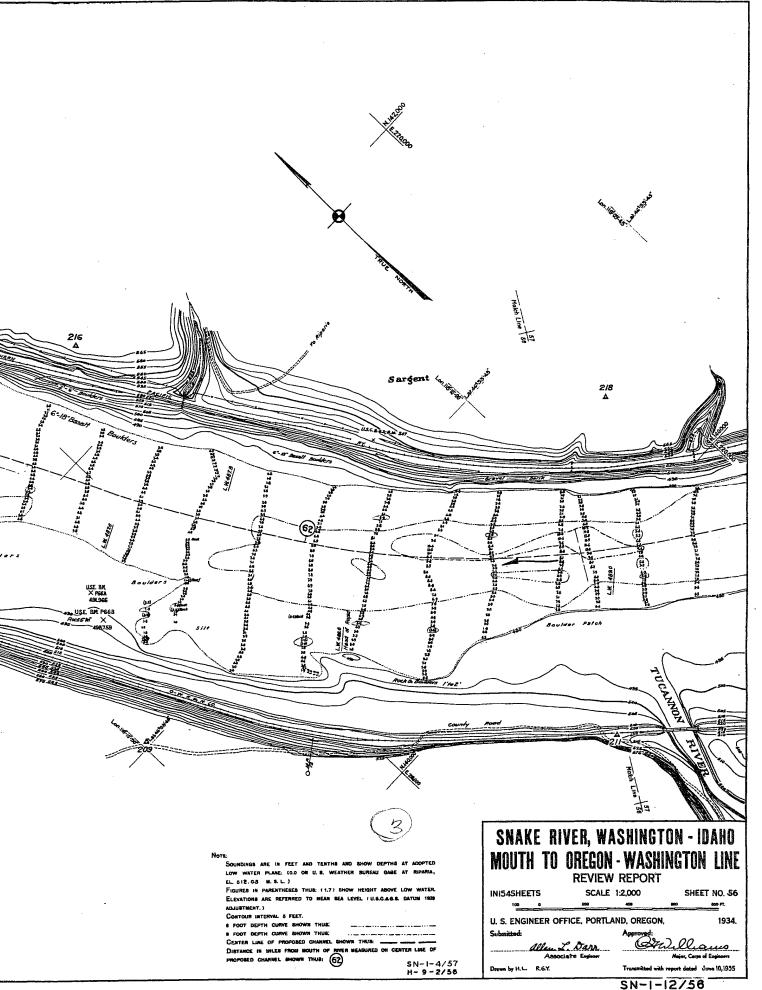


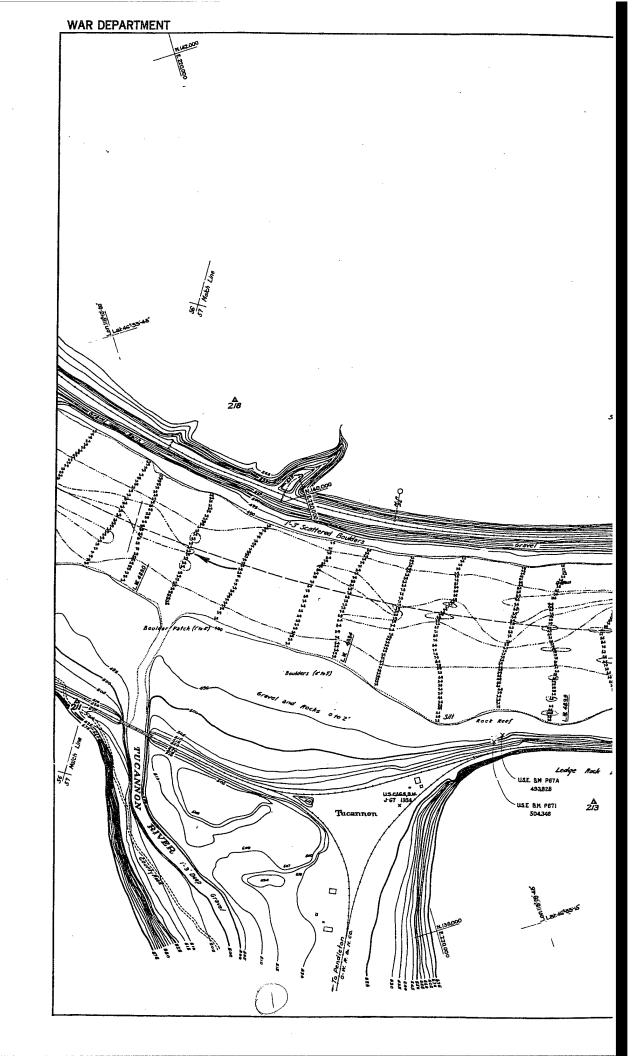


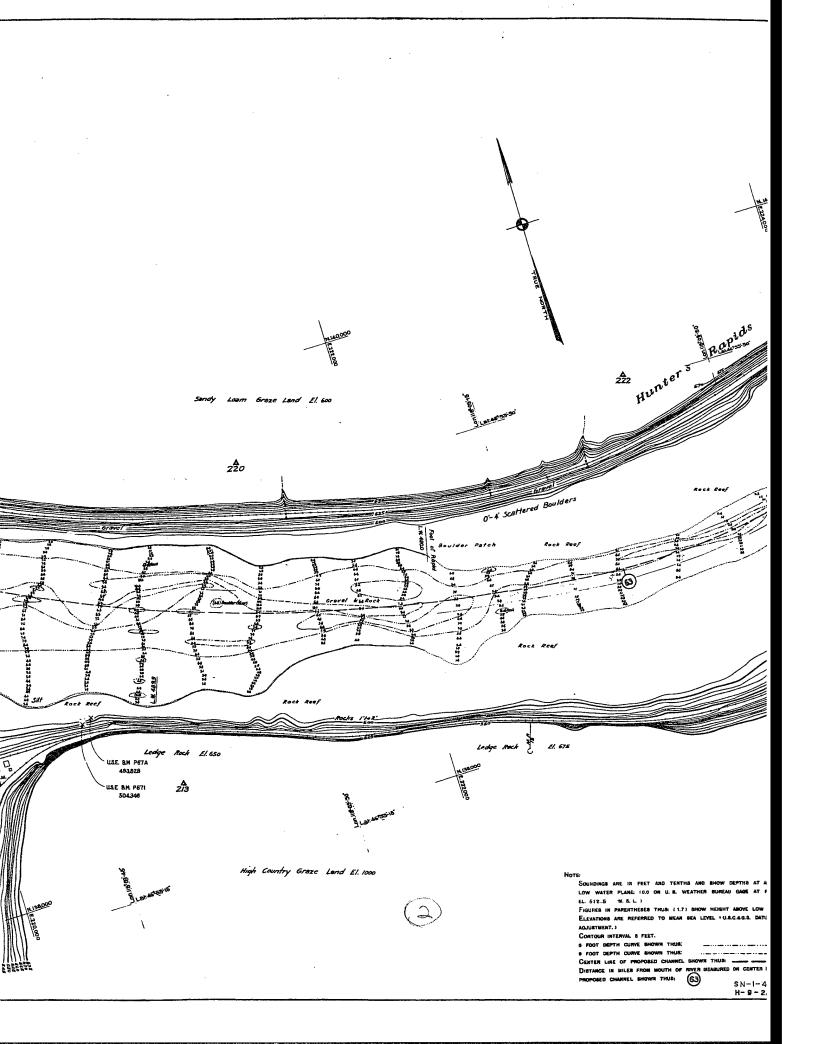












AGJUSTMENT.)

ACULETRIST.)
CONTOUR INTERVAL 6 FEET.
6 FOOT DEPTH CURVE SHOWN THUS:
9 FOOT DEPTH CURVE SHOWN THUS:
CENTER LINE OF PROPOSED CHANNEL DISTANCE IN MILES FROM MOUTH OF RIVER MEASURED ON CENTER LINE OF PROPOSED CHARREL SHOWN THUS:

(63)

SN-1-4/58

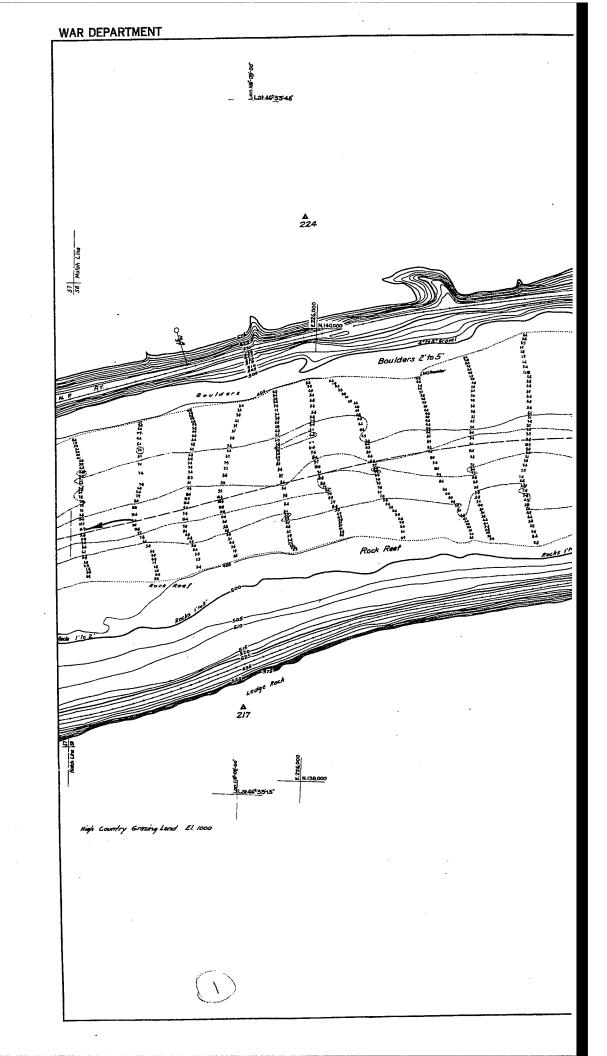
SN-1-4/58 H-9-2/57

U. S. ENGINEER OFFICE, PORTLAND, OREGON,

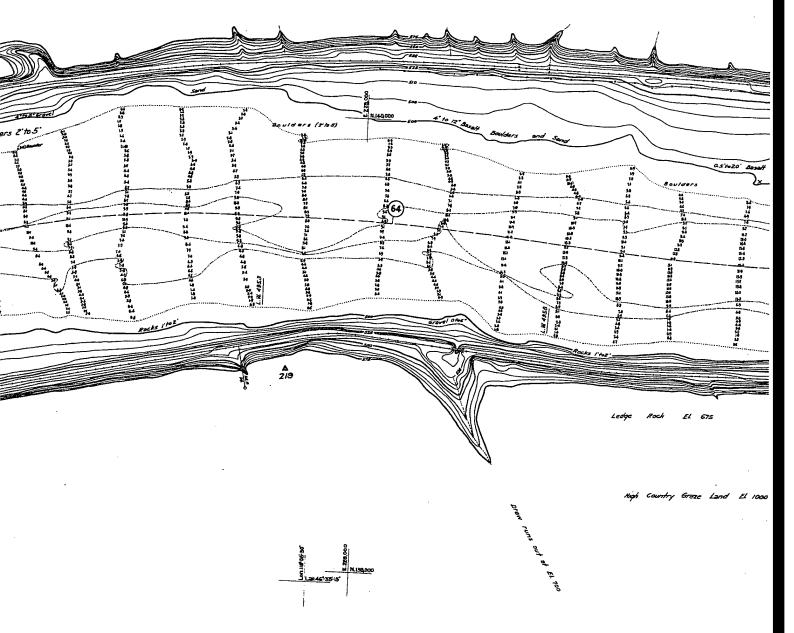
Drw.llows

Alles L. Darr. Associate Engineer Drawe by H.L. R.G.Y.

report dated June 10, 1935



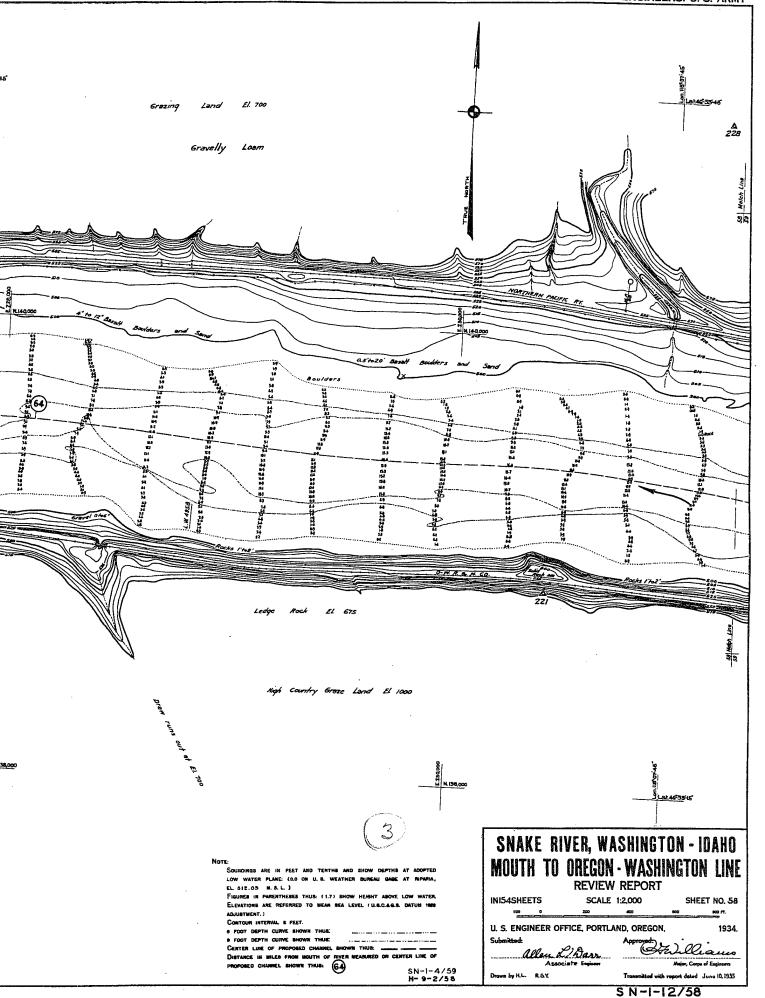
El. 700

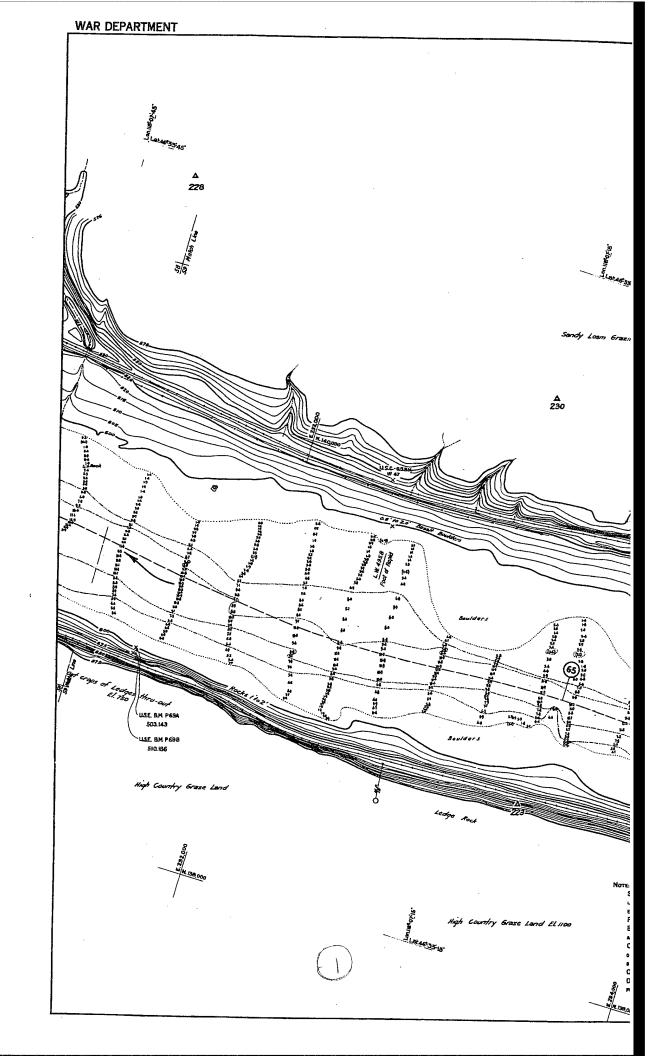


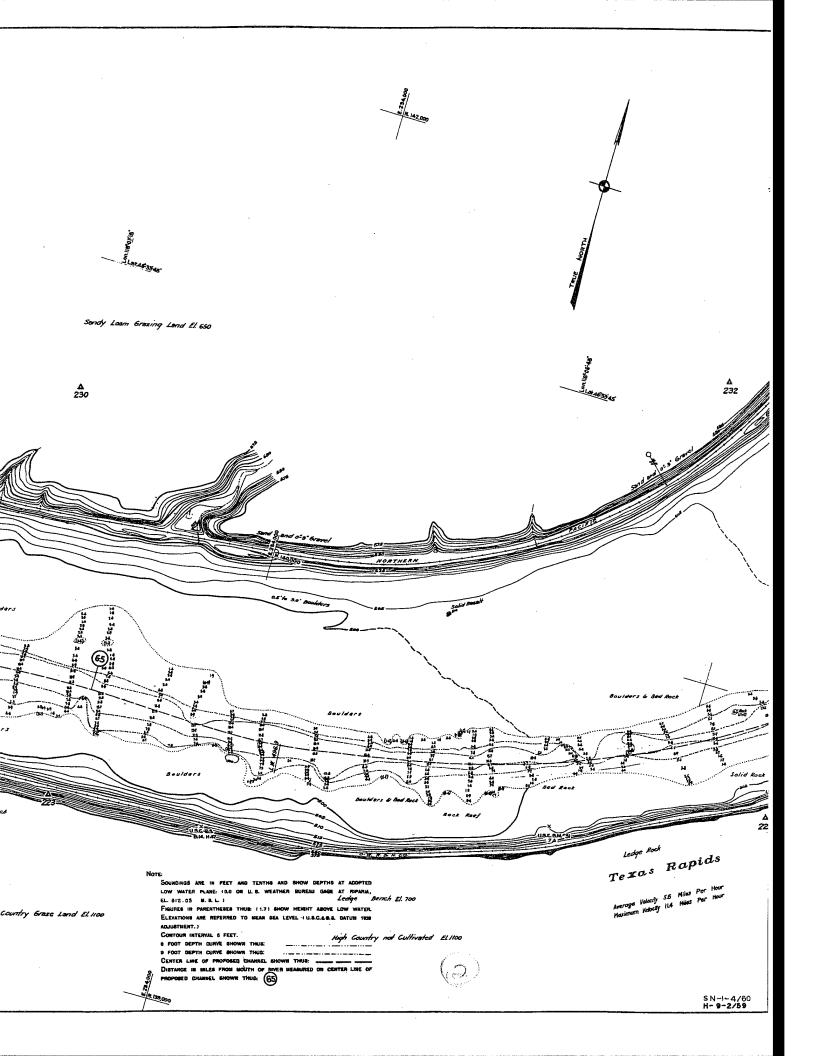
NOTE:
SOUNDINGS ARE IN FEET AND TENTHS COUNTINES ARE PLANE (CO. ON U. S. WEATHER BURKEL GARE AT EL. 517.05 M. S. L.) FIGURES IN PARENTHEESE THUS: (1.7) SHOW NEAHT ABOVE LOW ELEVATIONS ARE REFERRED TO MEAR SEA LEYEL ILLB.C.S.S. DAI

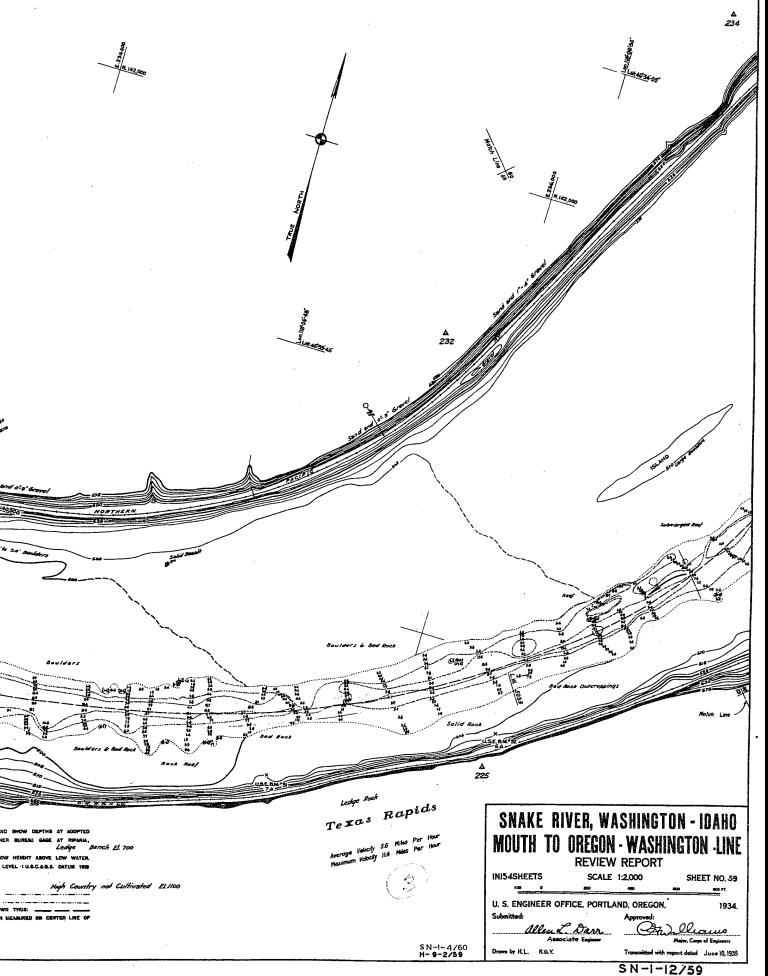
ELEVATIONS ARE REFERRED TO MEAN TABLE
ADJUSTMENT.)
CONTOUR INTERNAL 6 FEET.
6 FOOT DEPTH CURVE SHOWN THUS:
9 FOOT DEPTH CURVE SHOWN THUS:
CENTER LURE OF PROPOSED CHAMBEL SHOWN THUS:
DISTANCE IS SILES FROM SOUTH OF PRIVER SEASURED ON CE
PROPOSED CHAMBEL SHOWN THUS:

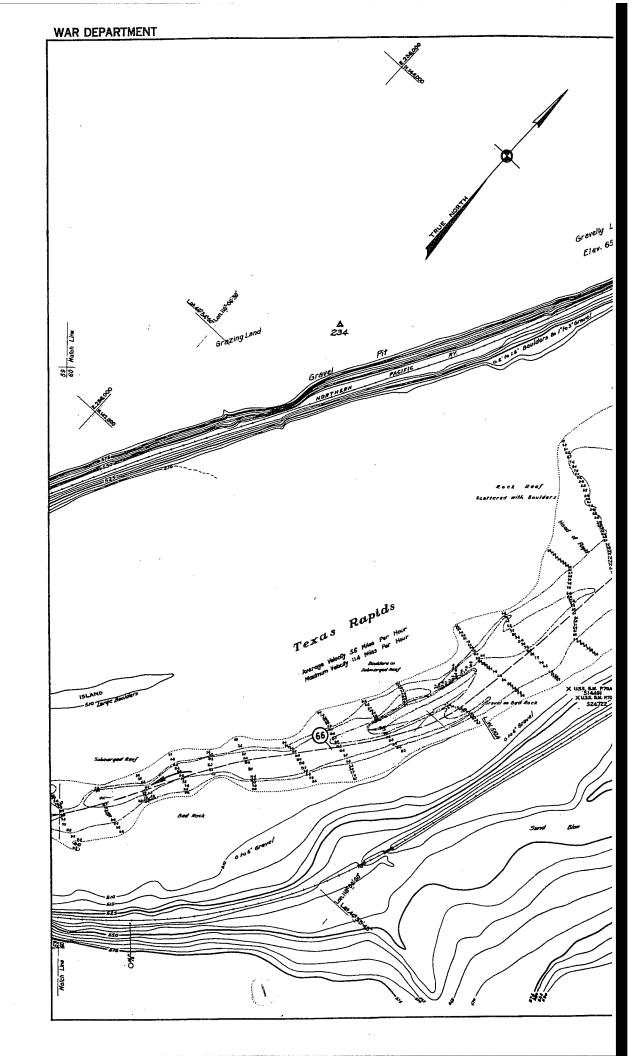
(64)

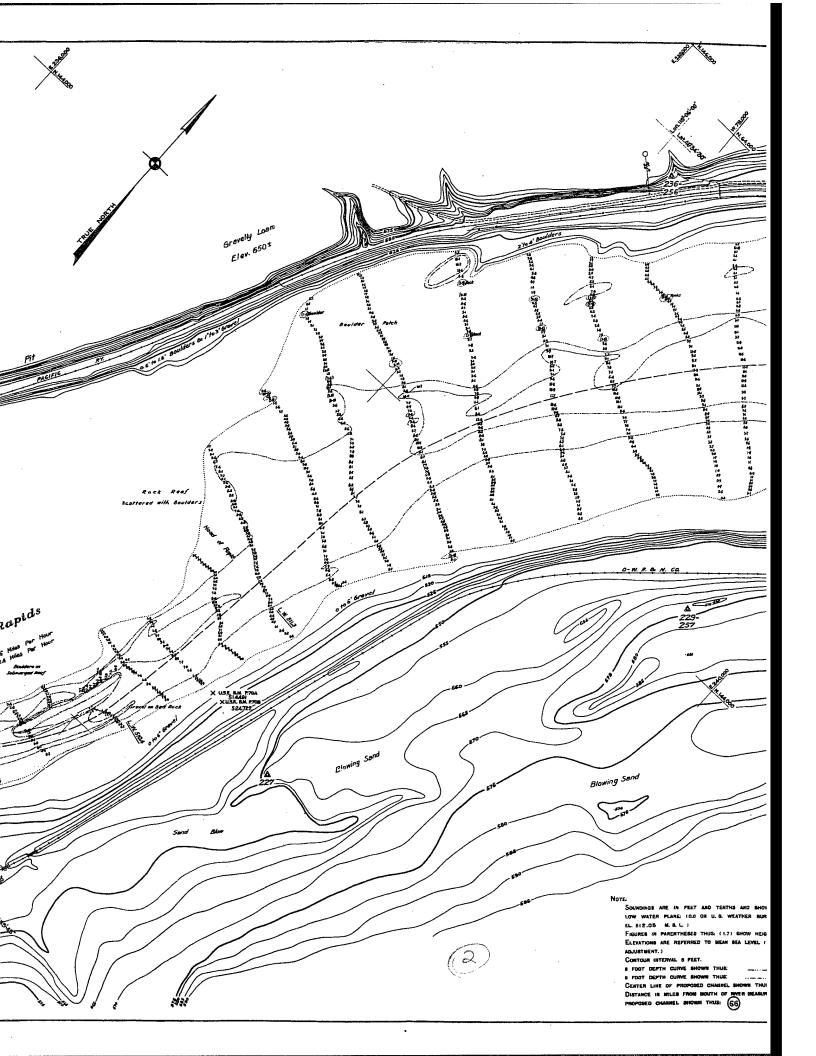


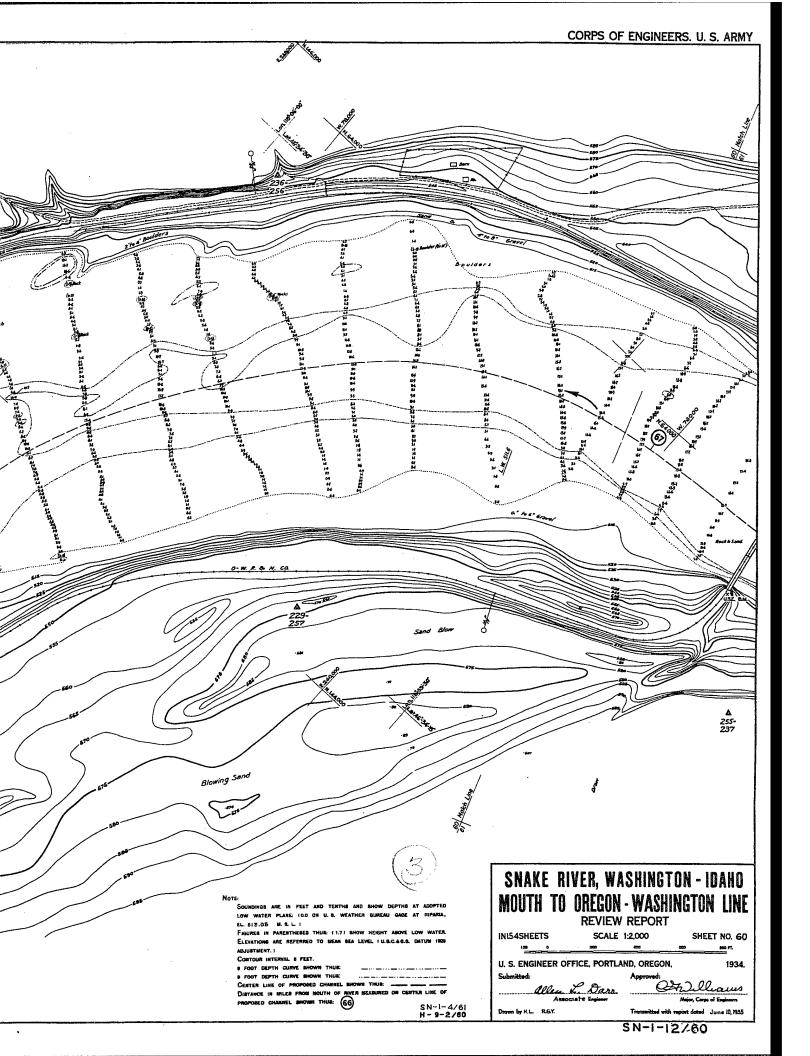


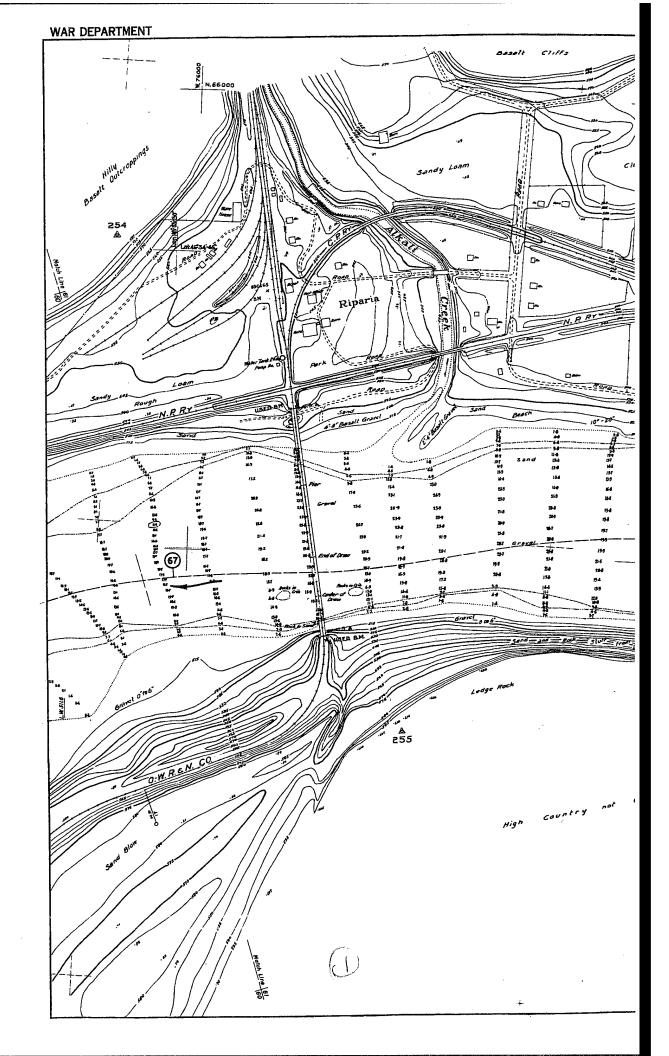


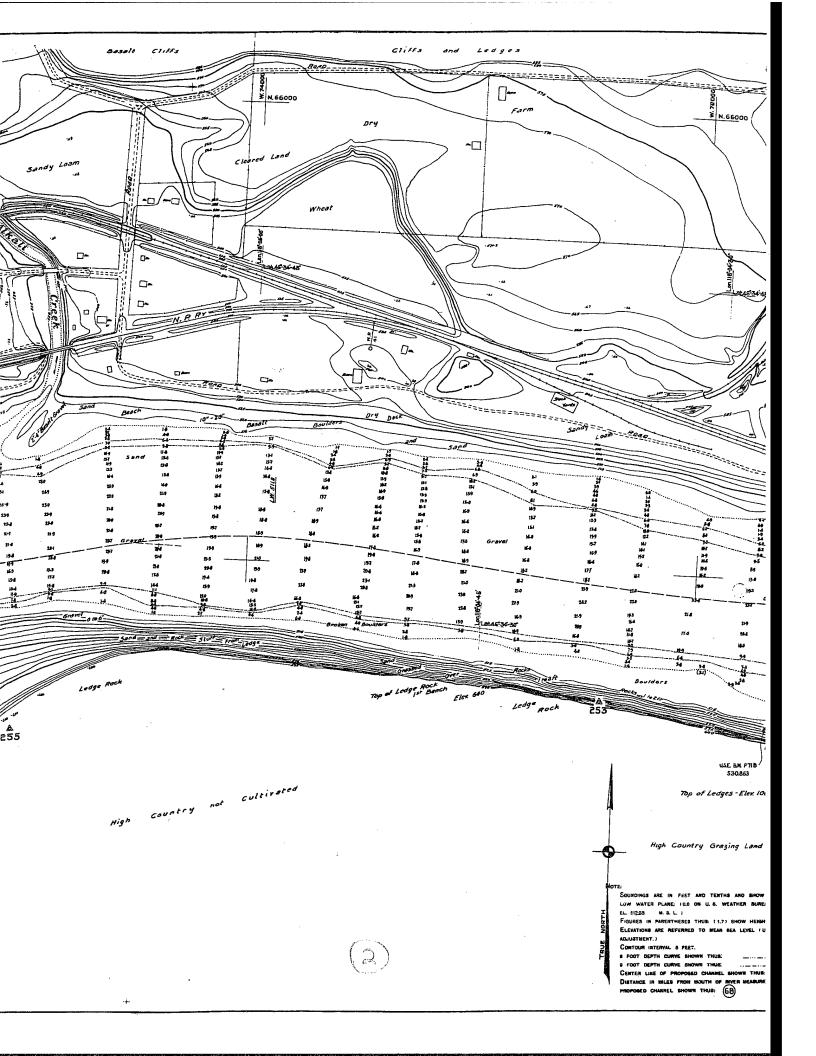


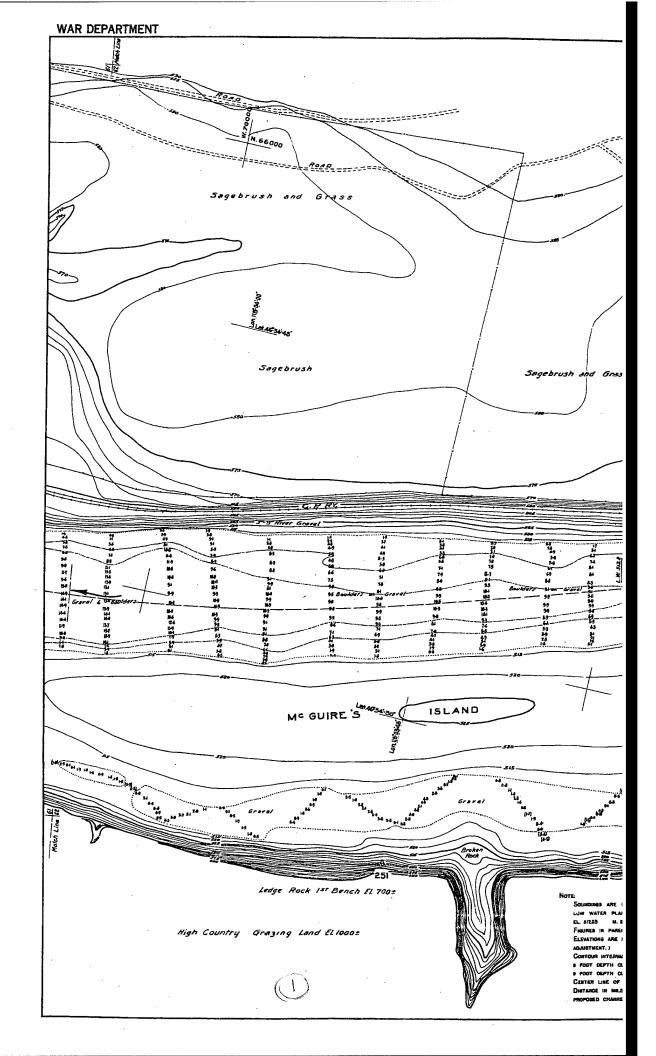


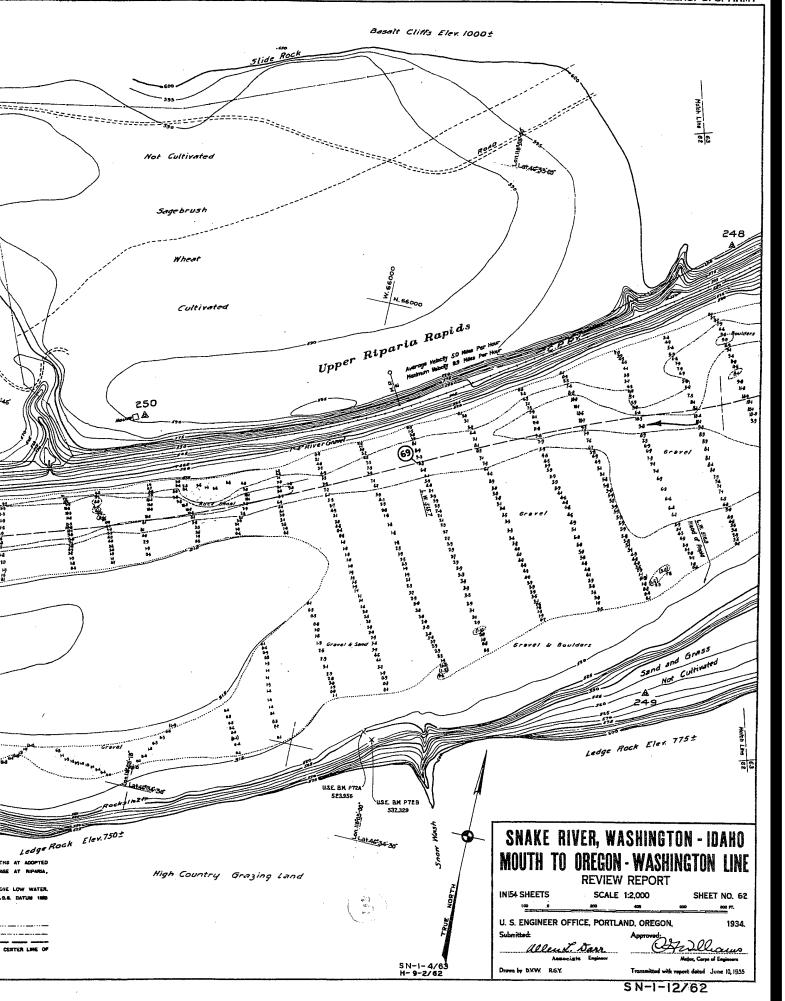


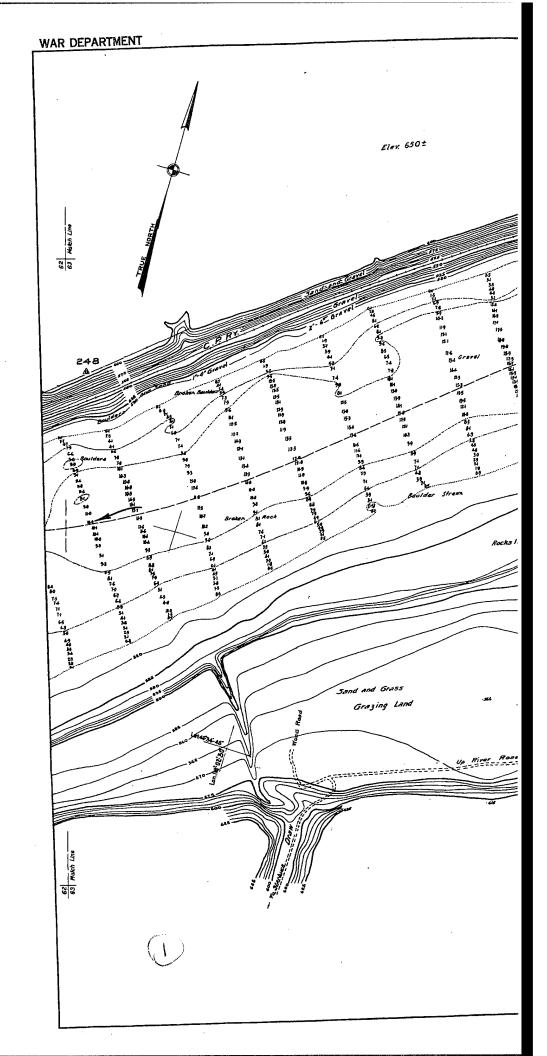


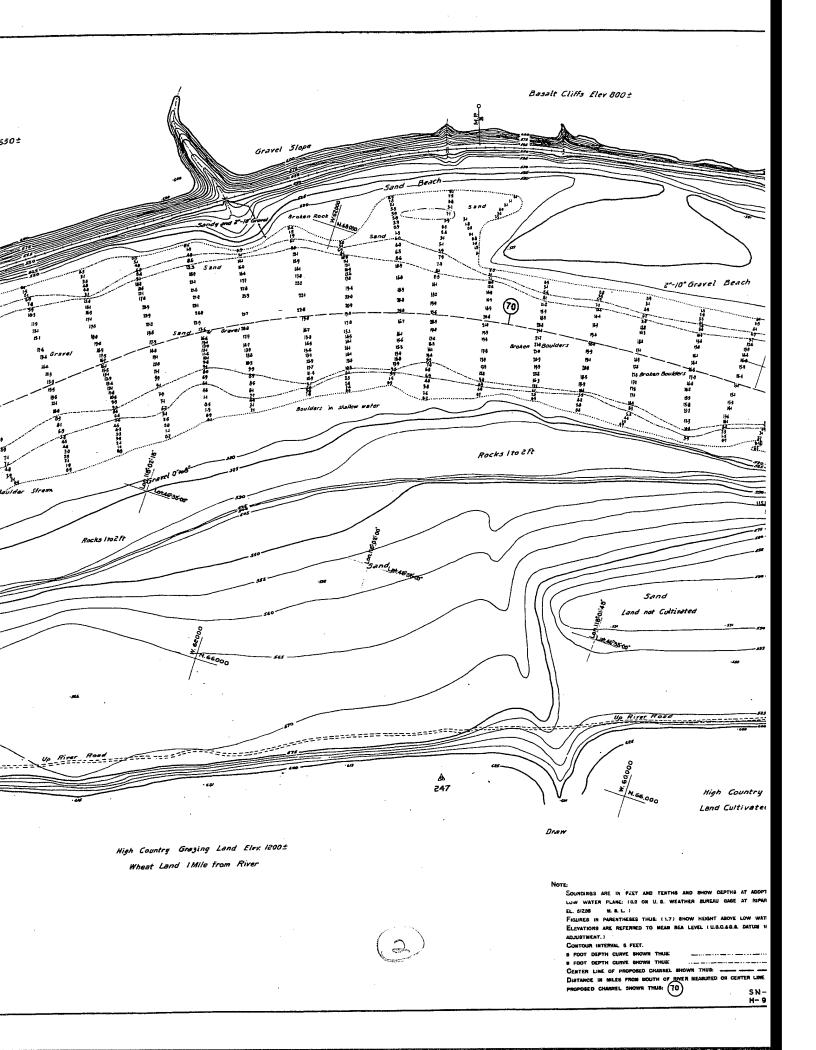


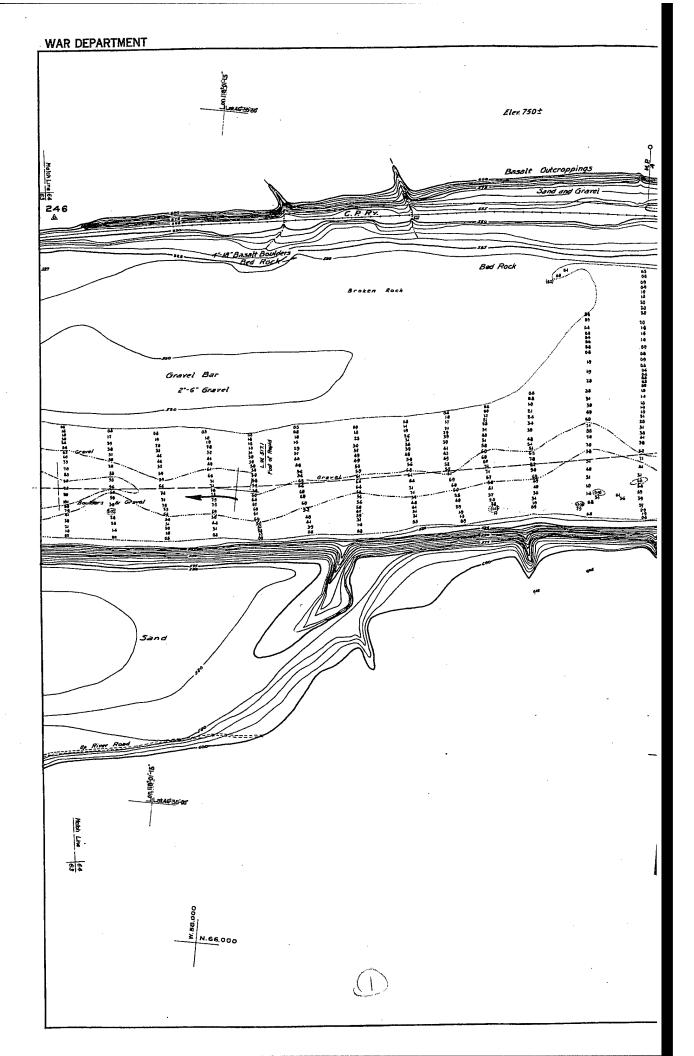


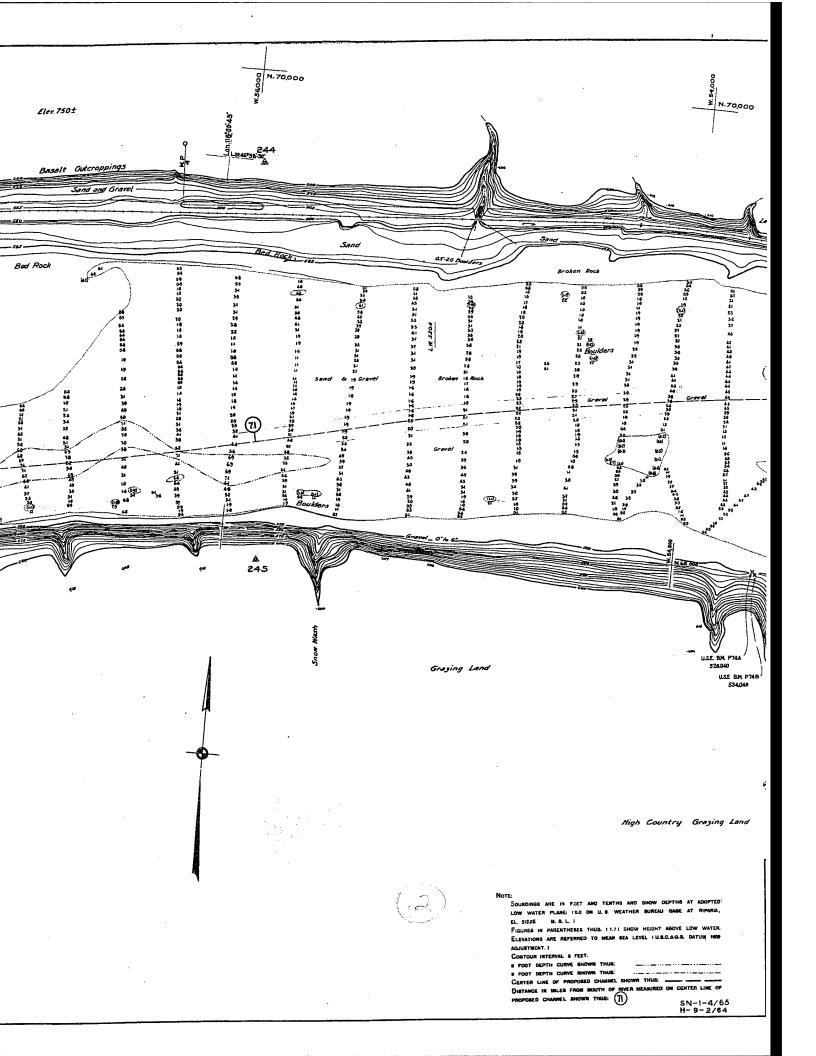


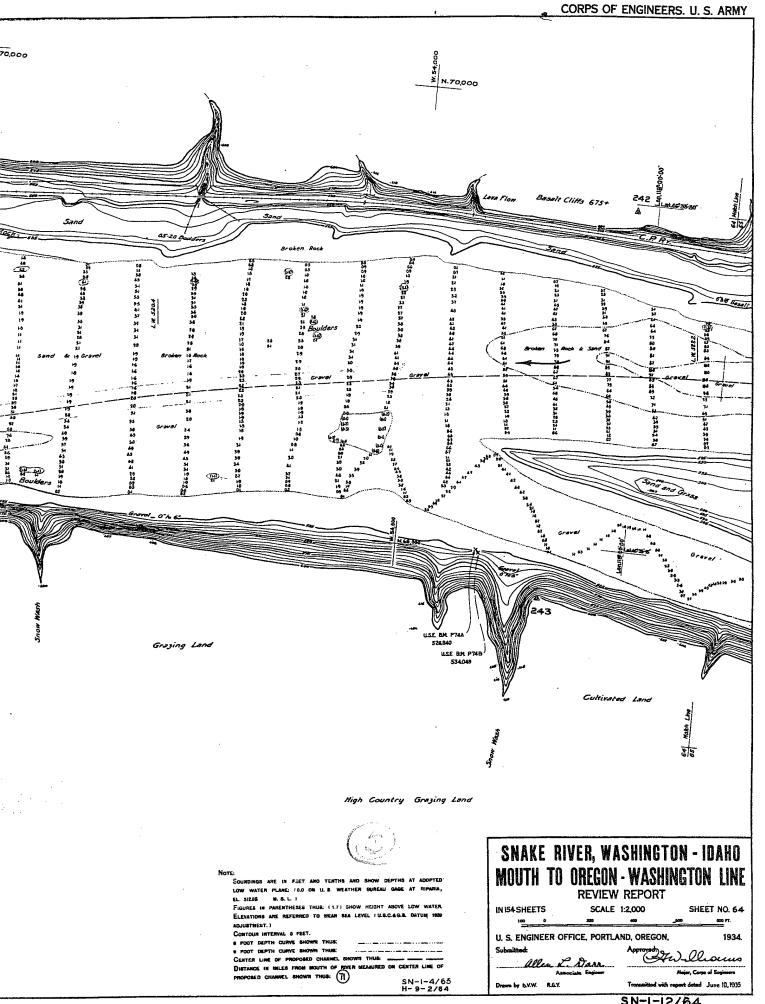


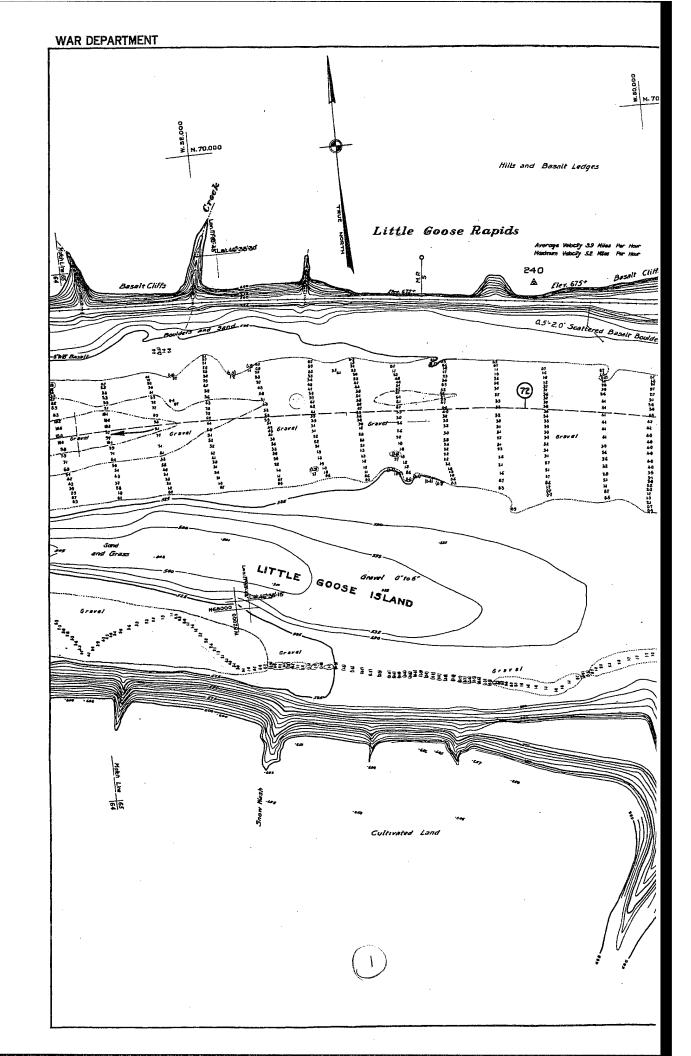


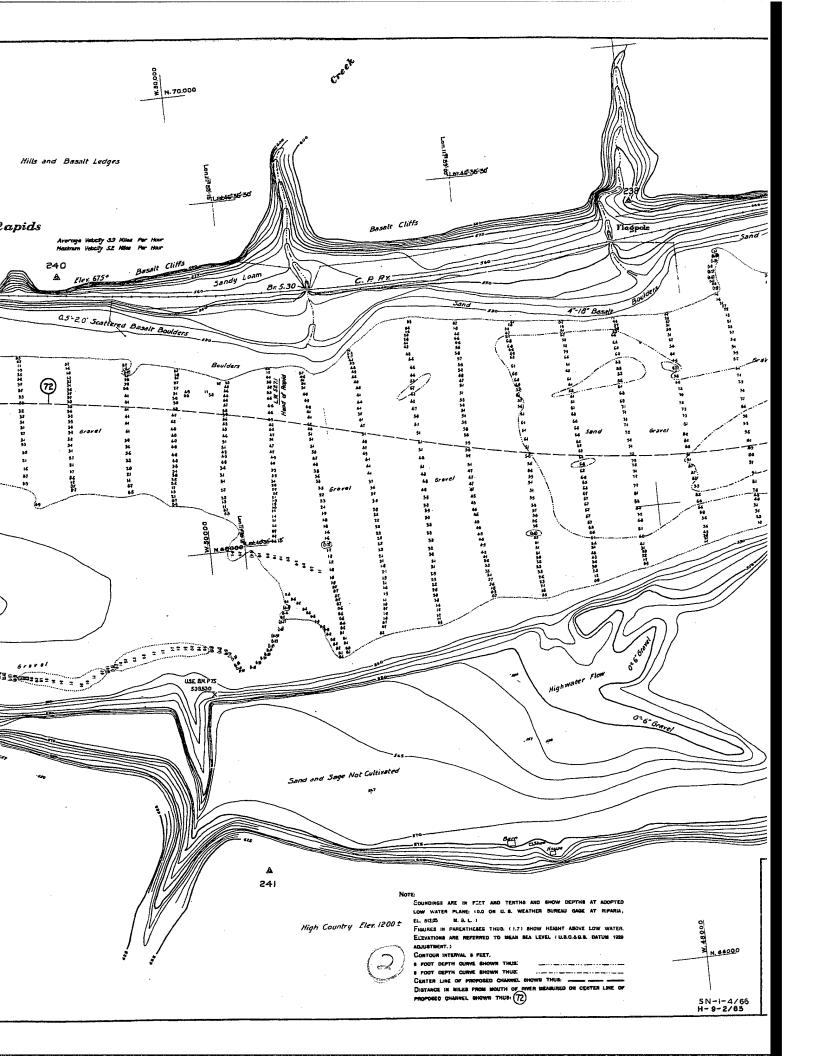


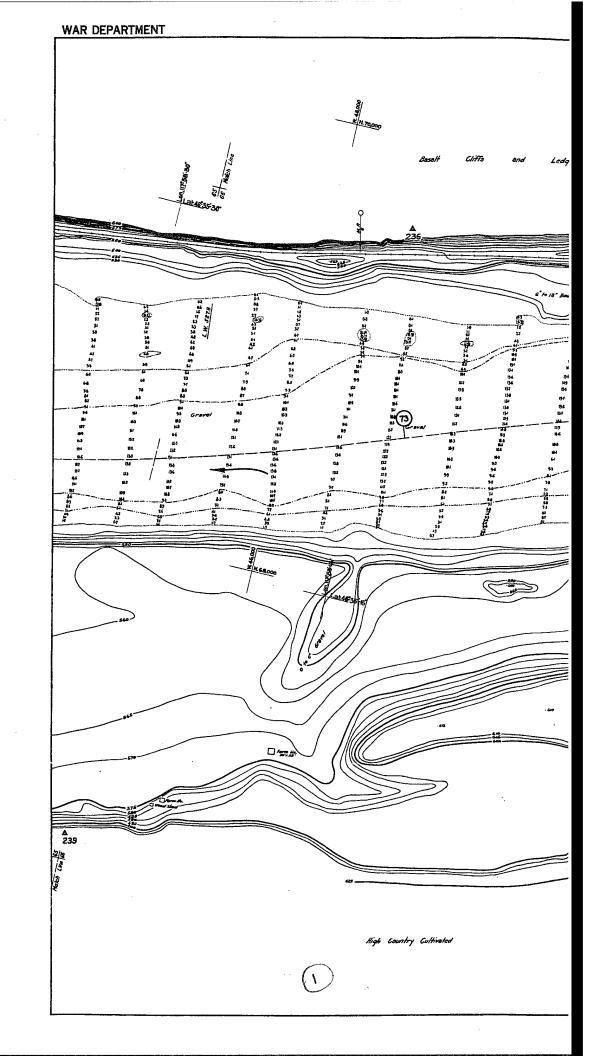




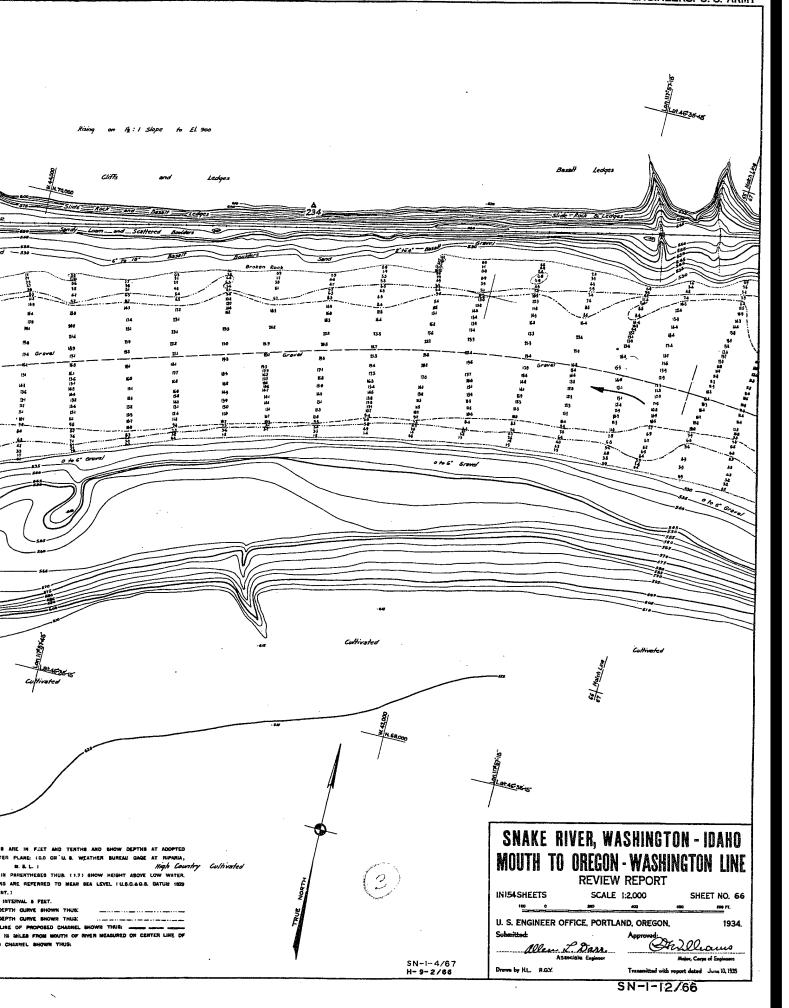


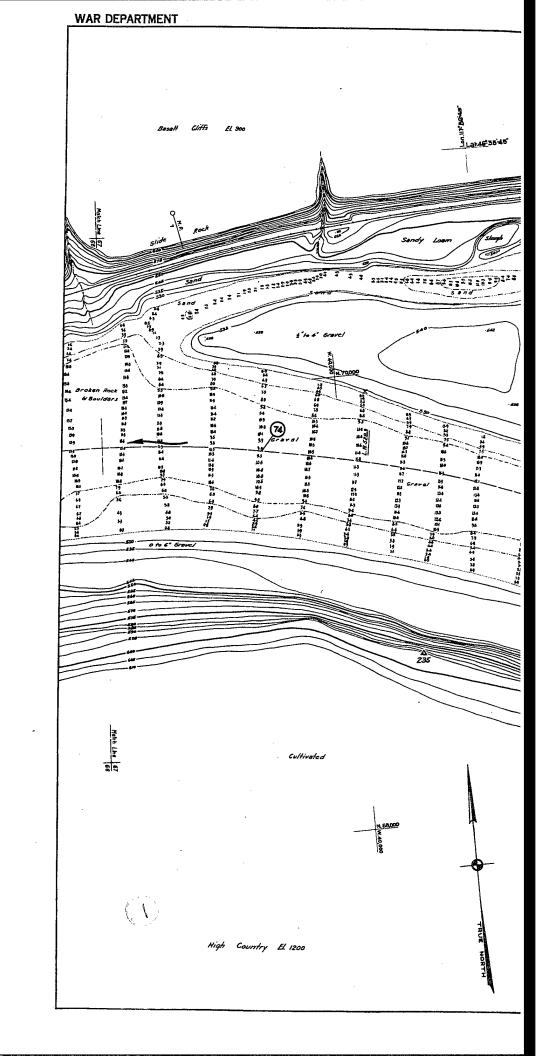






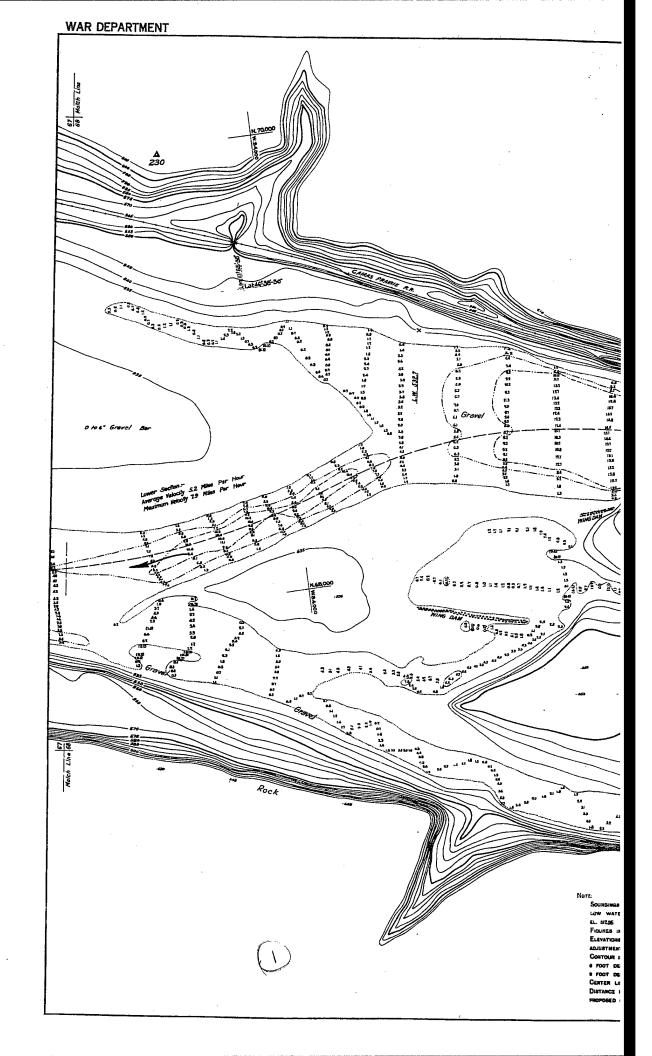
SN-1-4/6 H-9-2/6

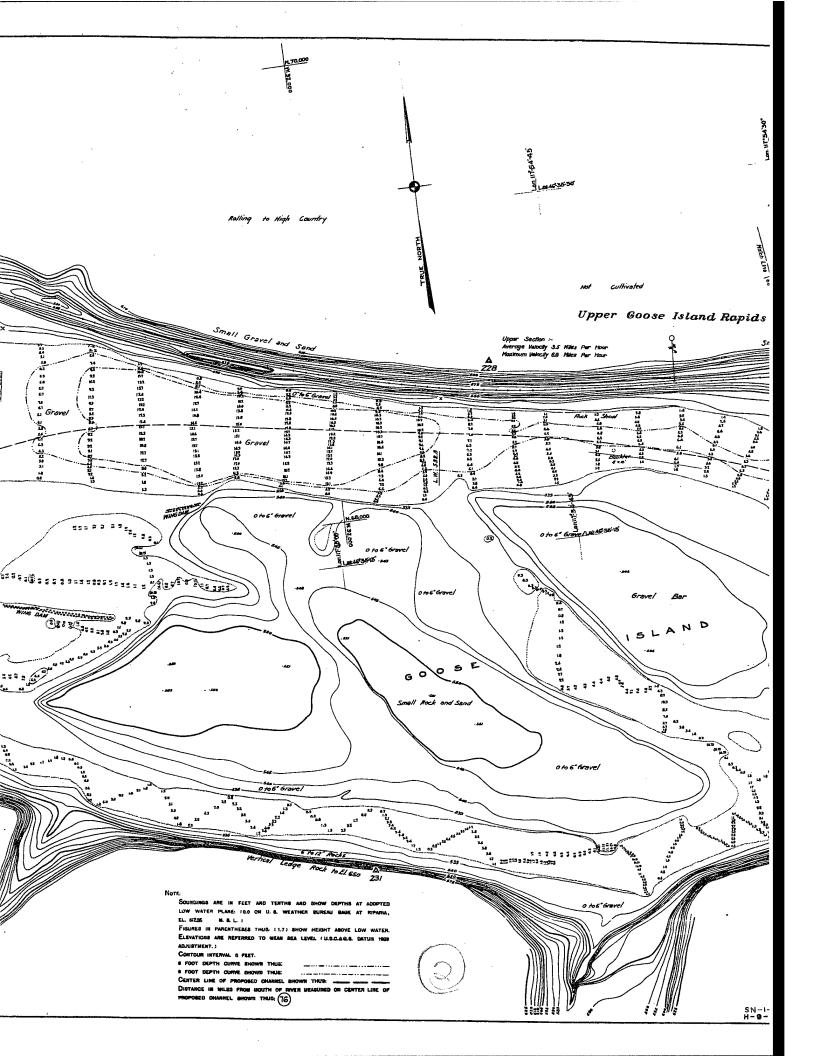


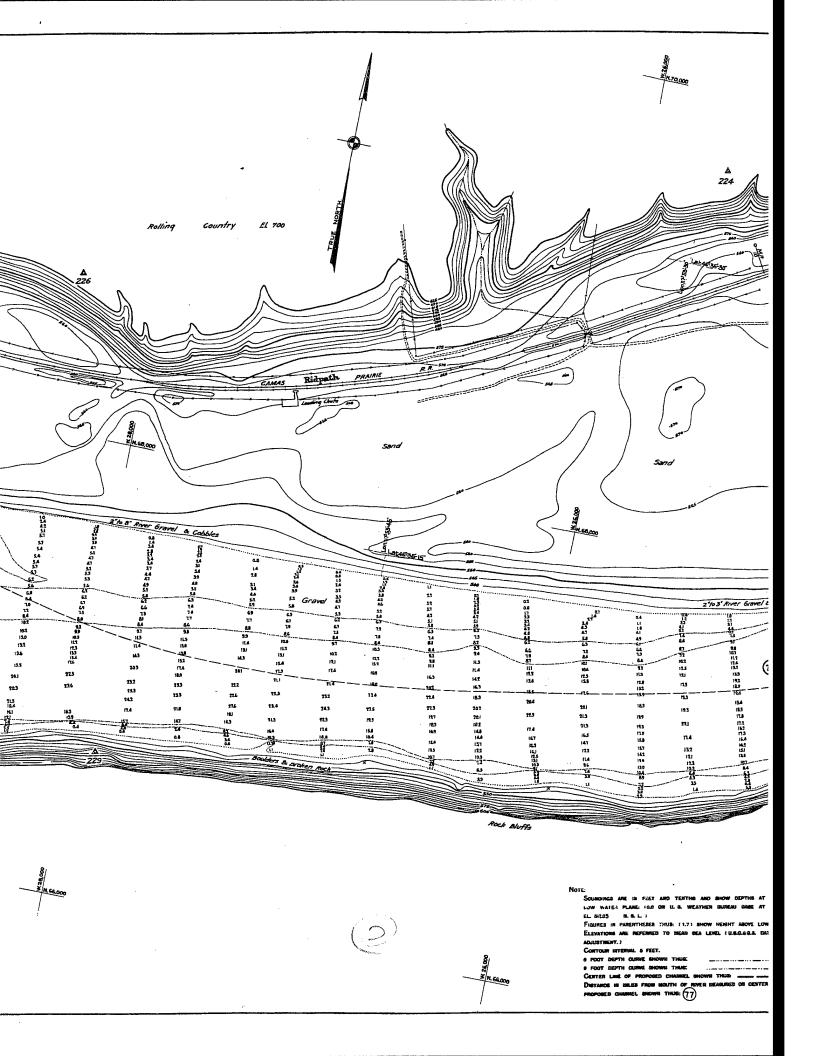


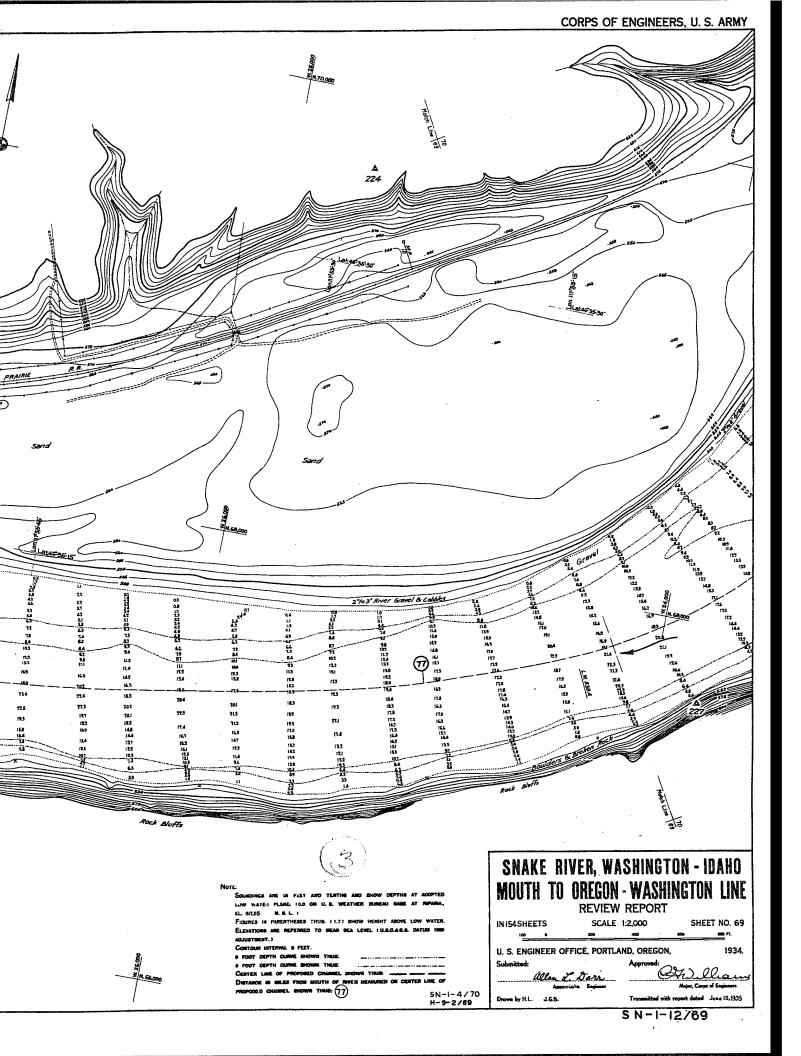


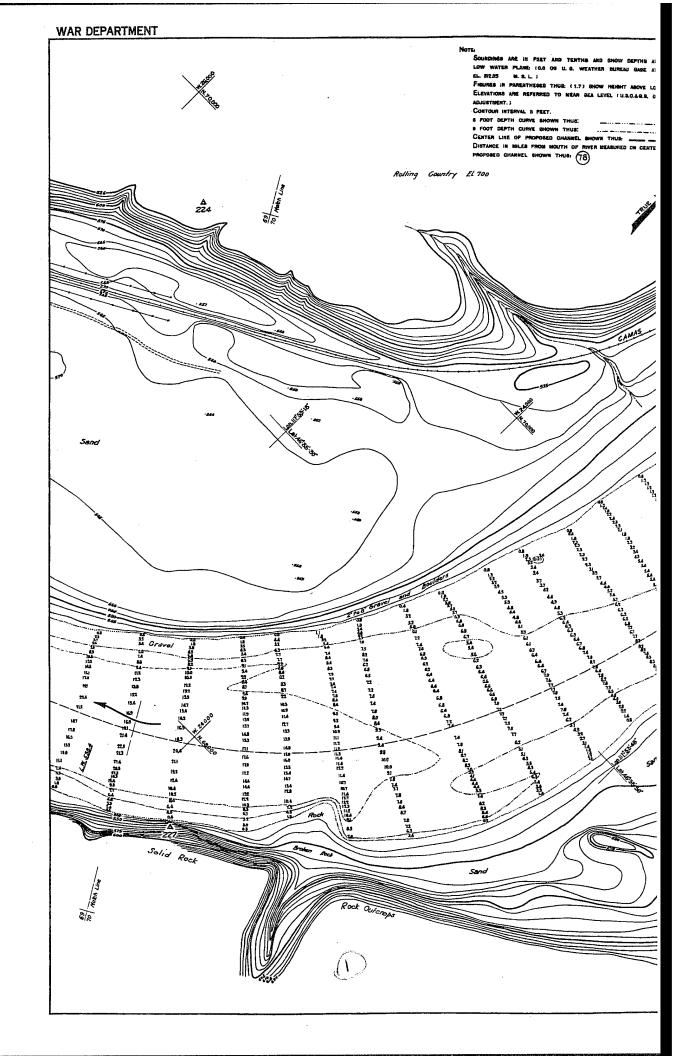
Drawn by H.L. R.G.Y.

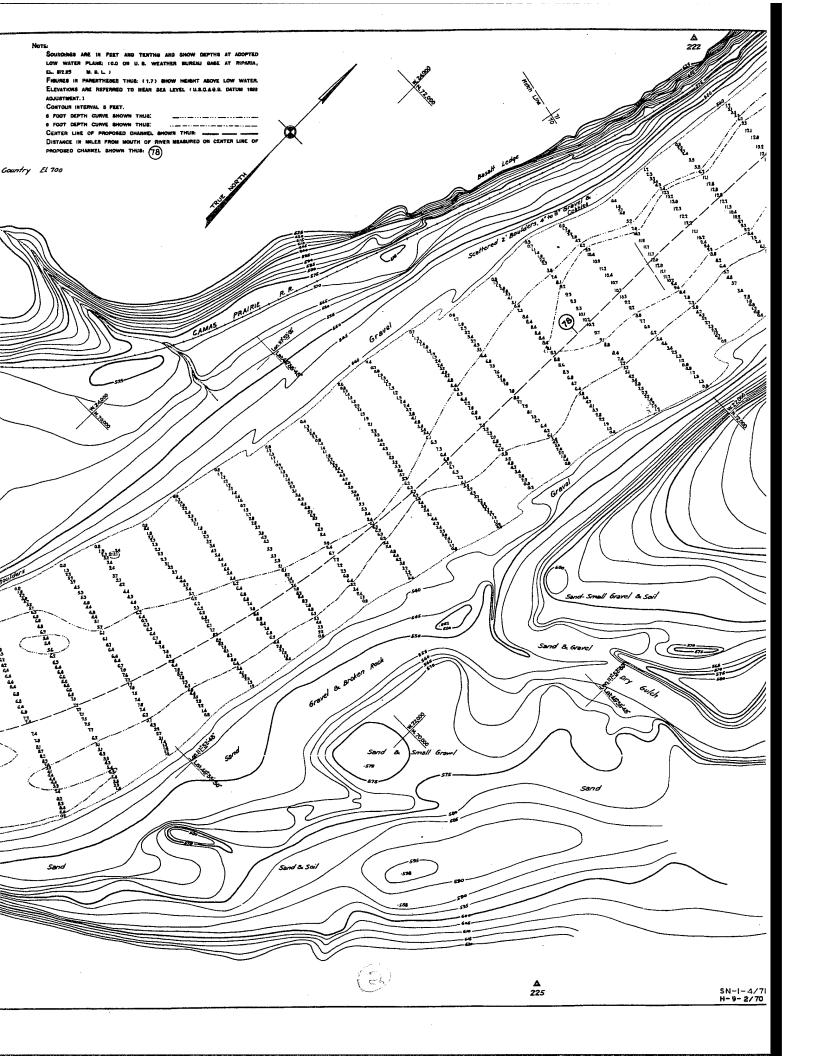


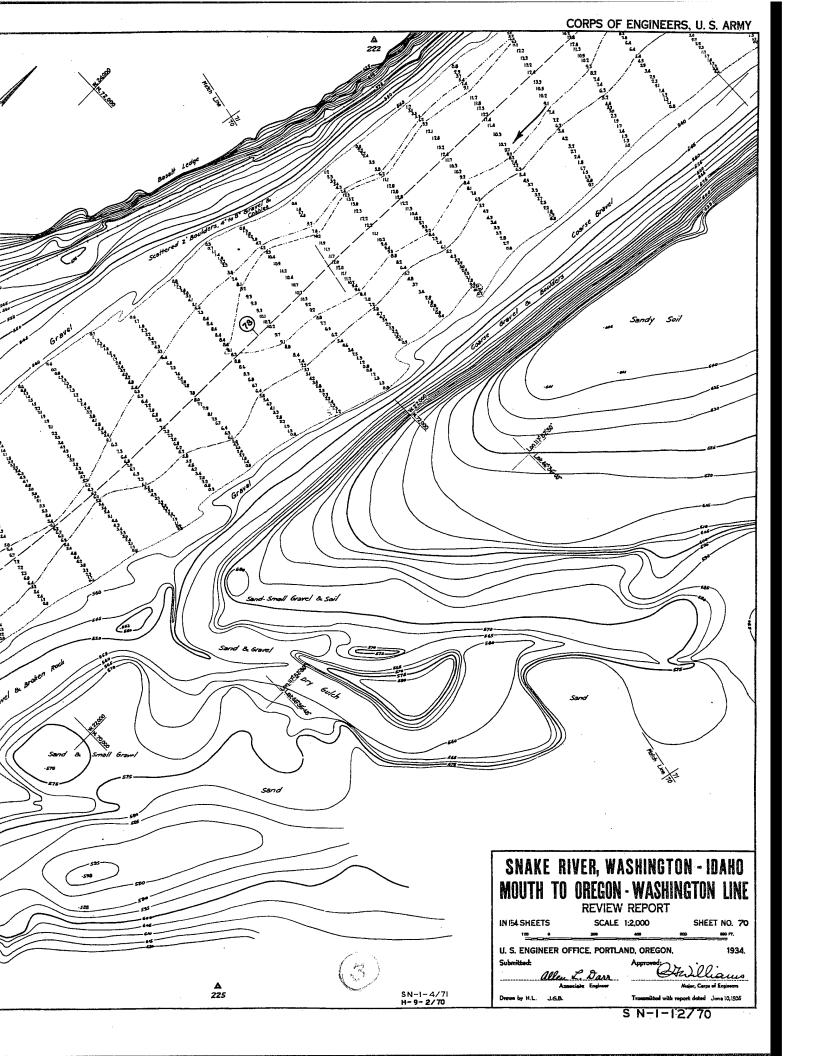


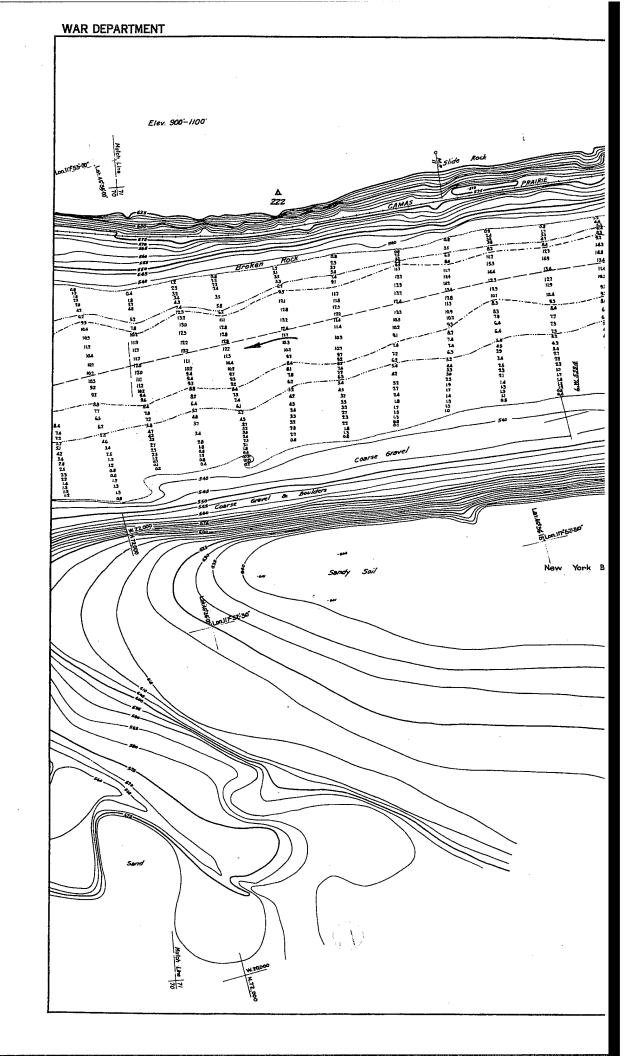


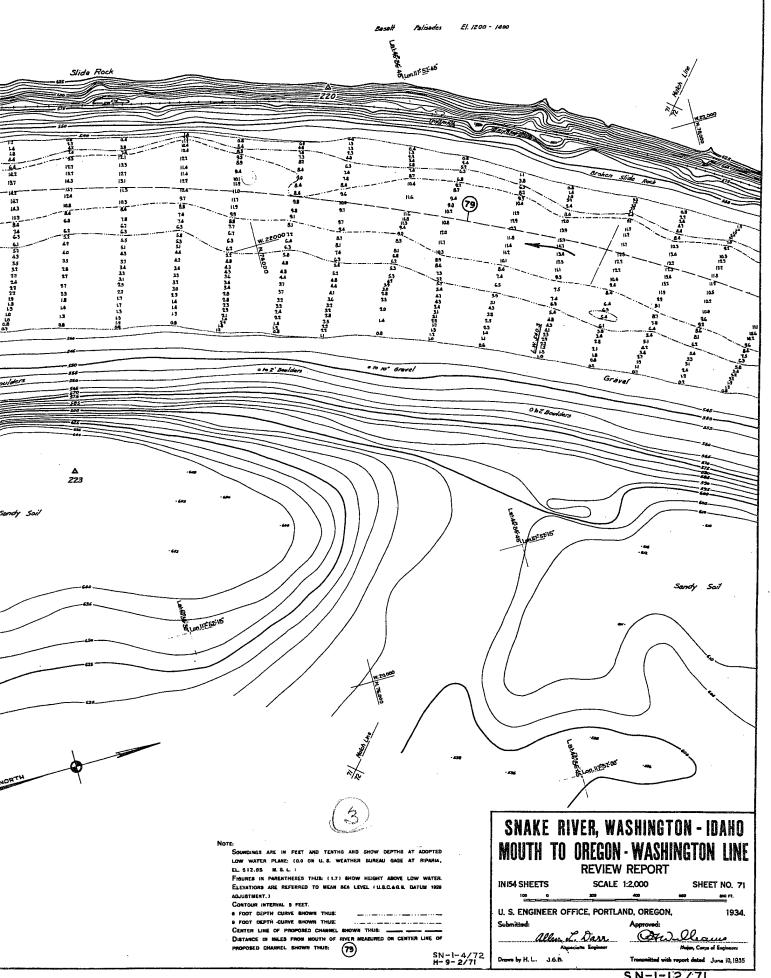


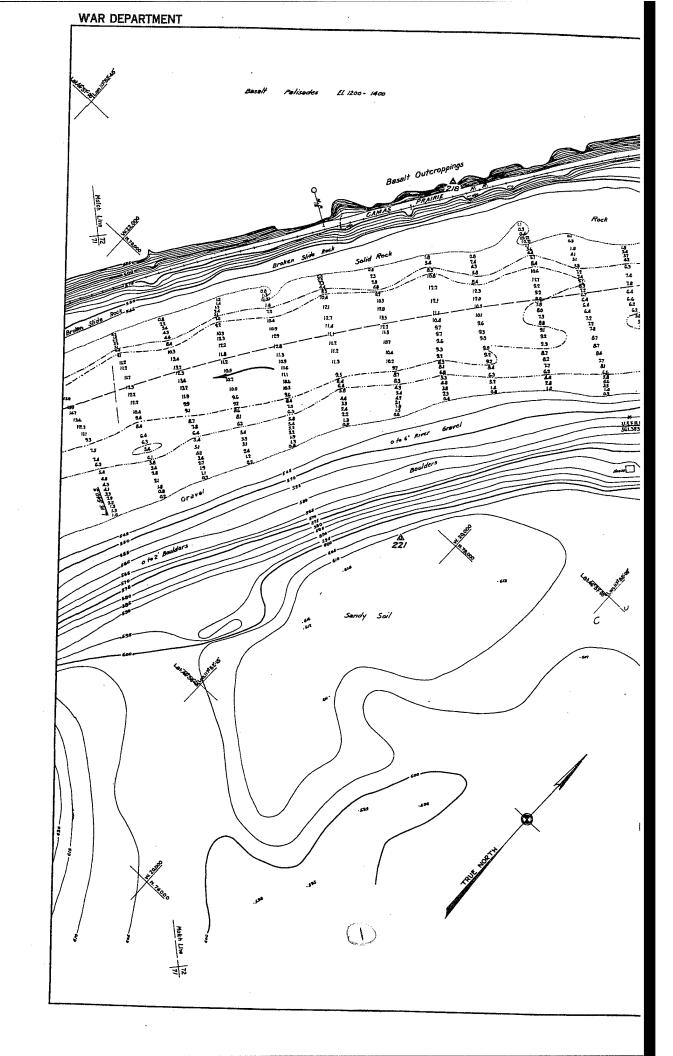




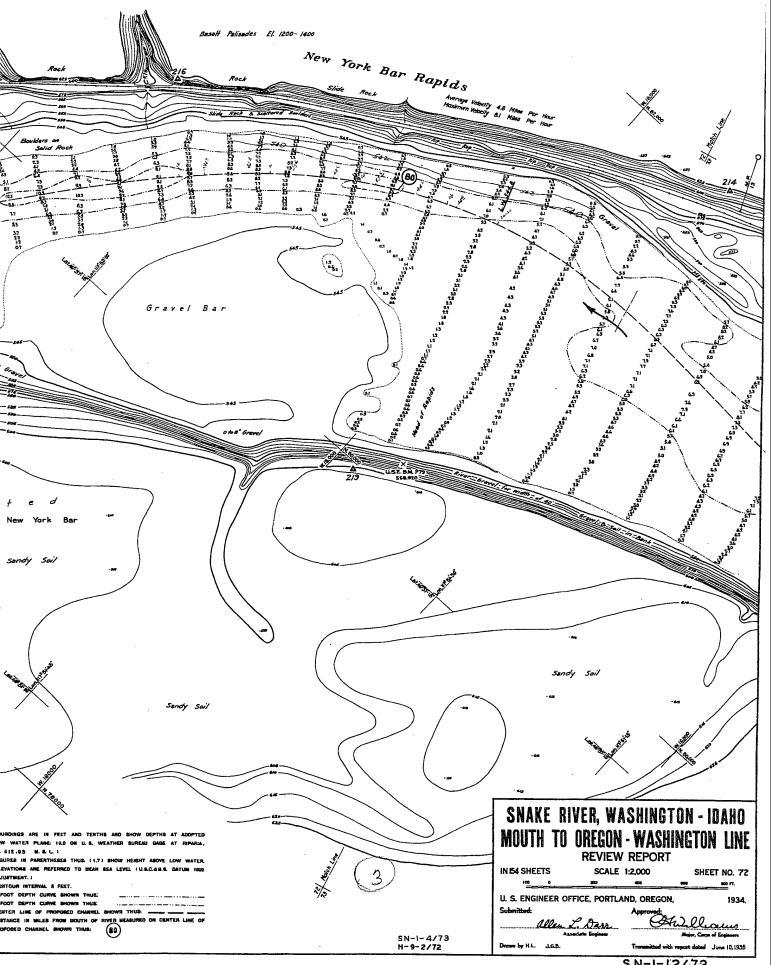


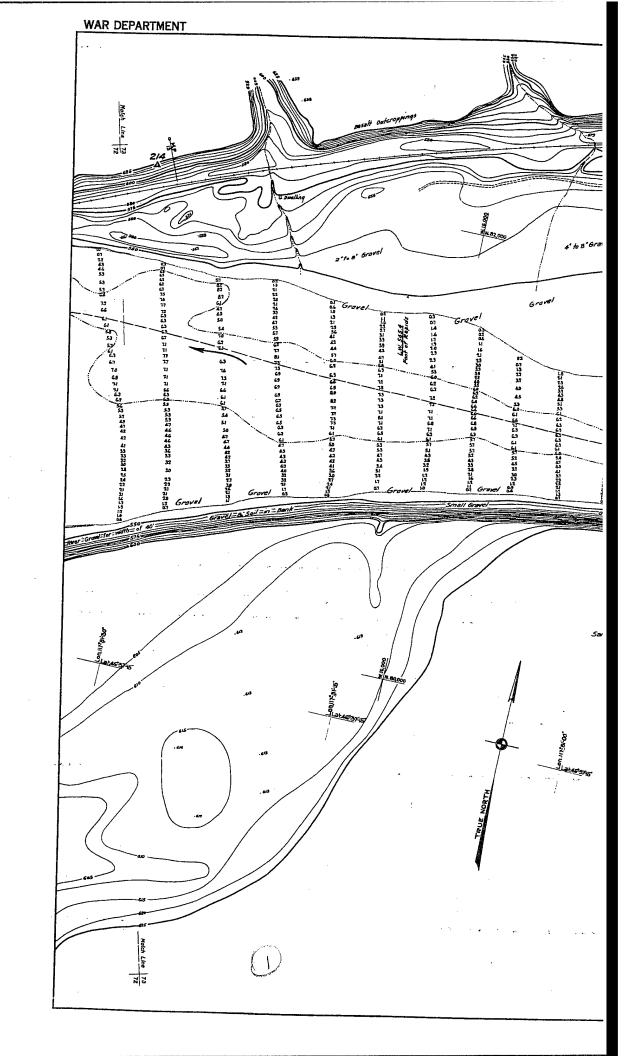






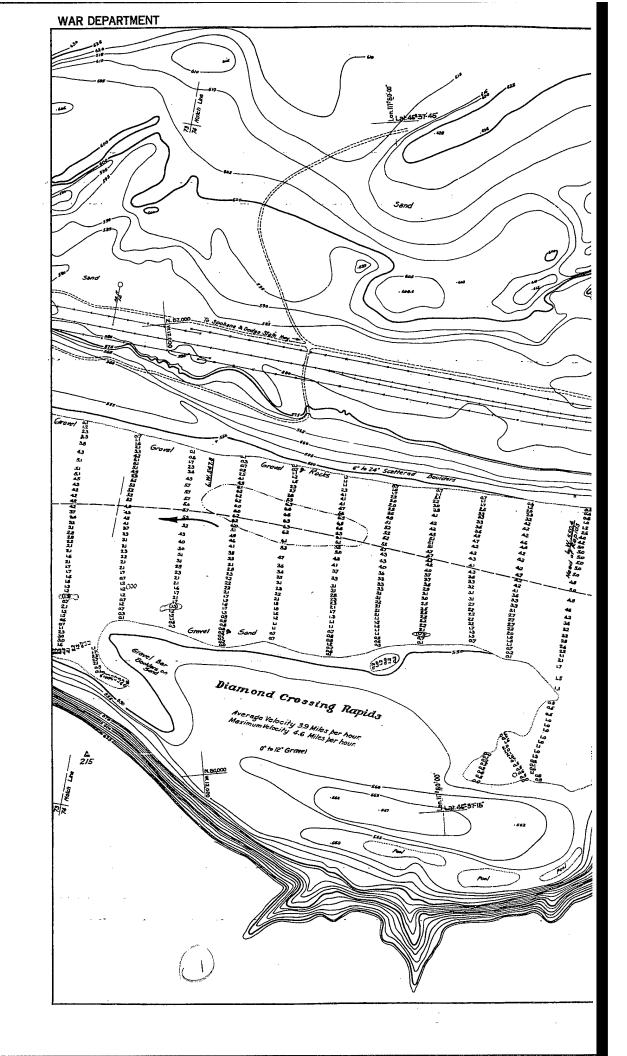


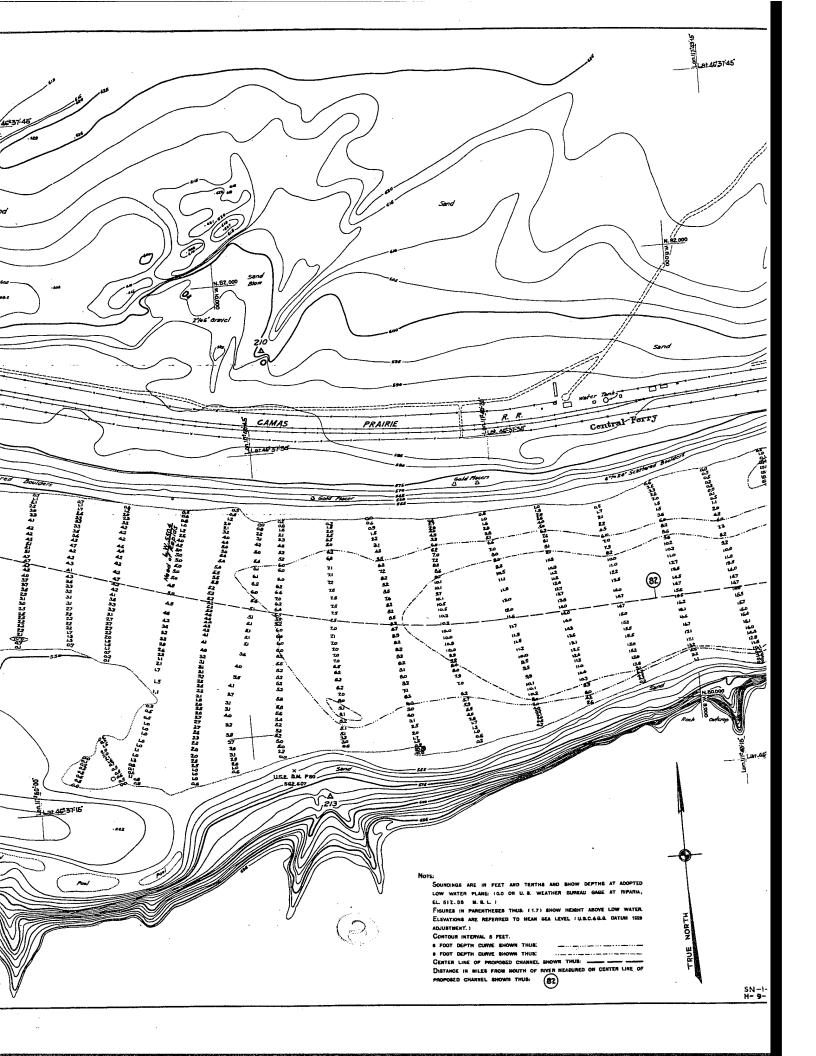




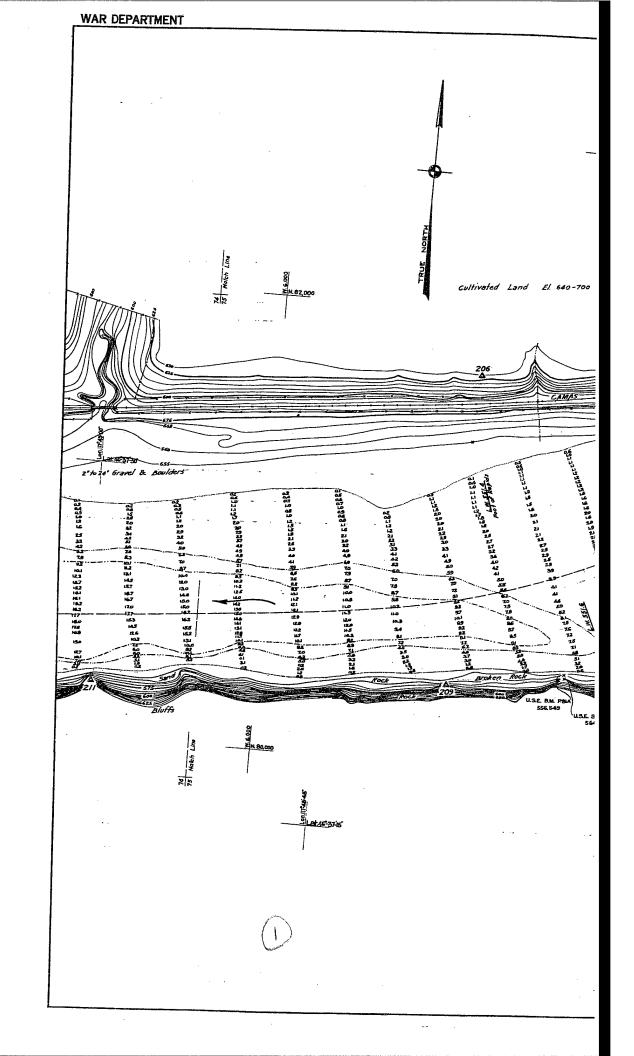


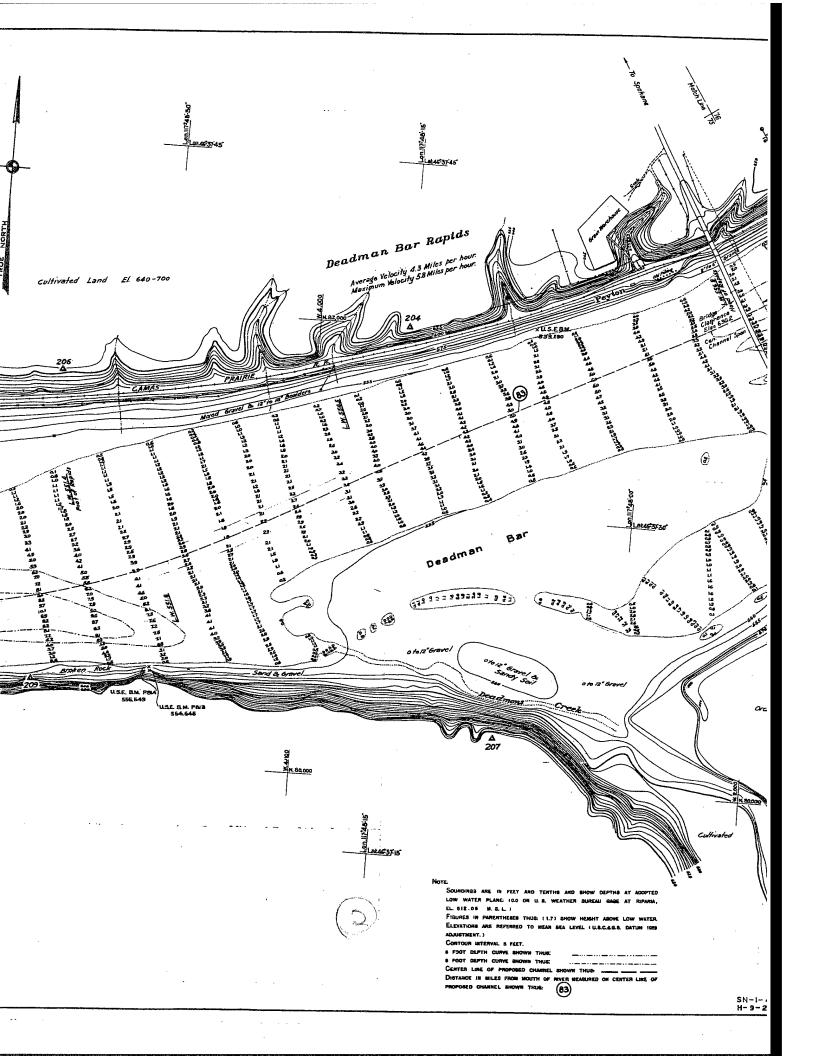


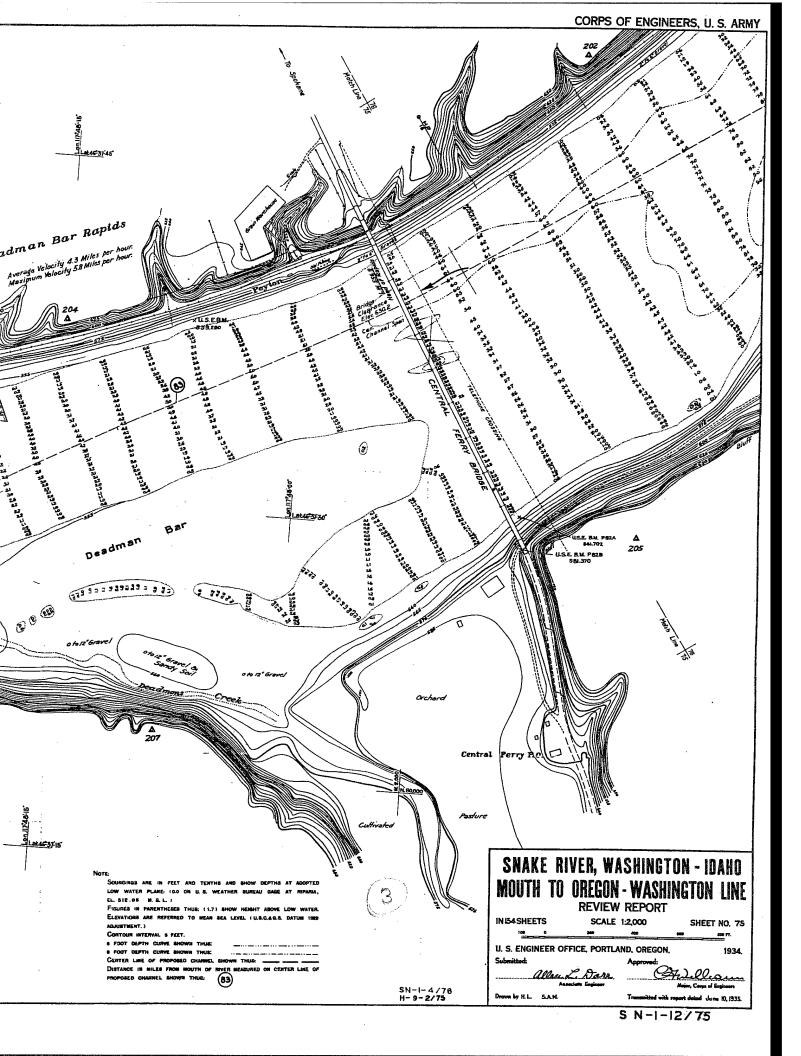


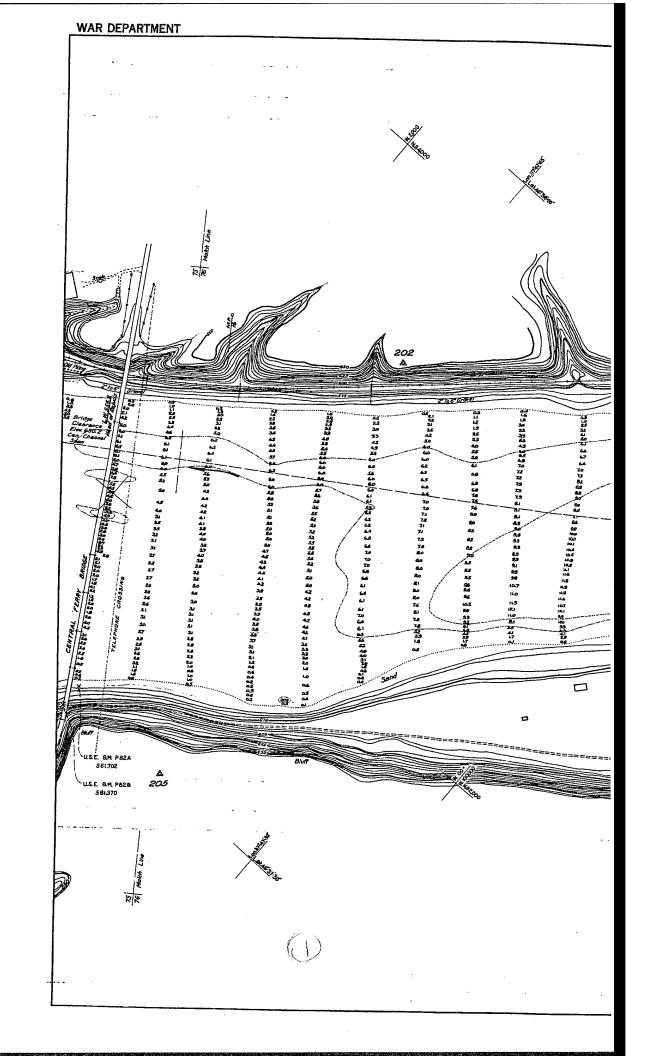


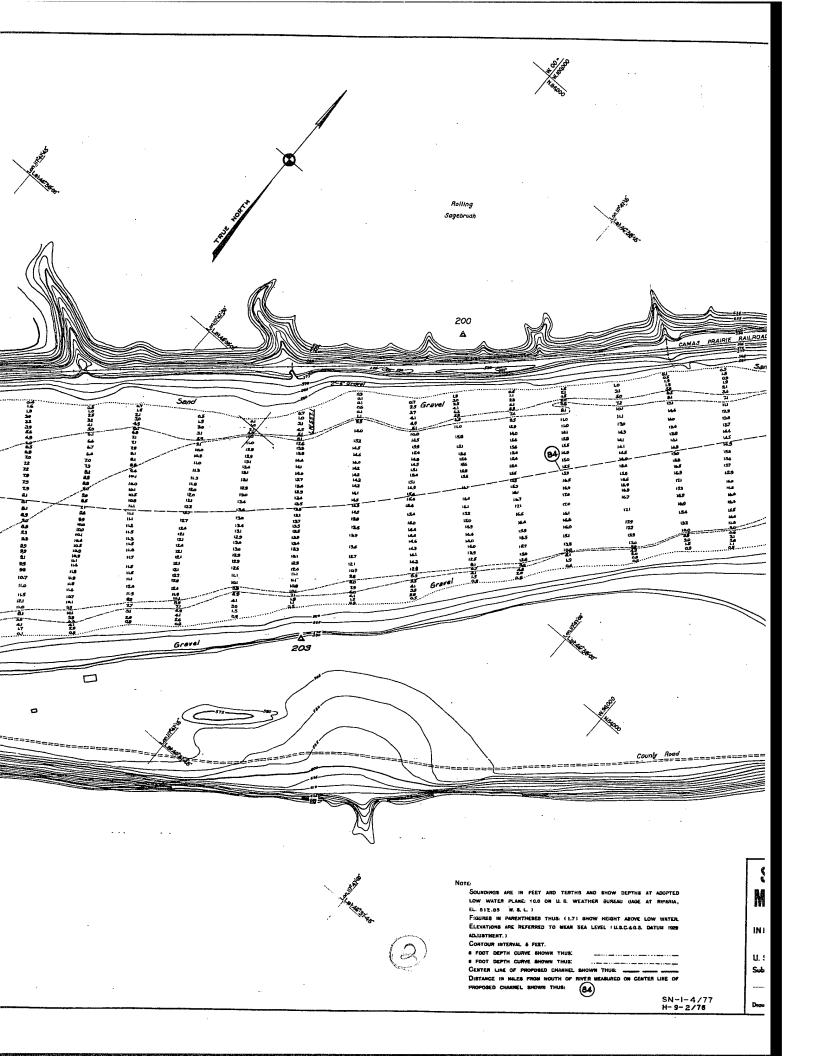
SN-1-12/74

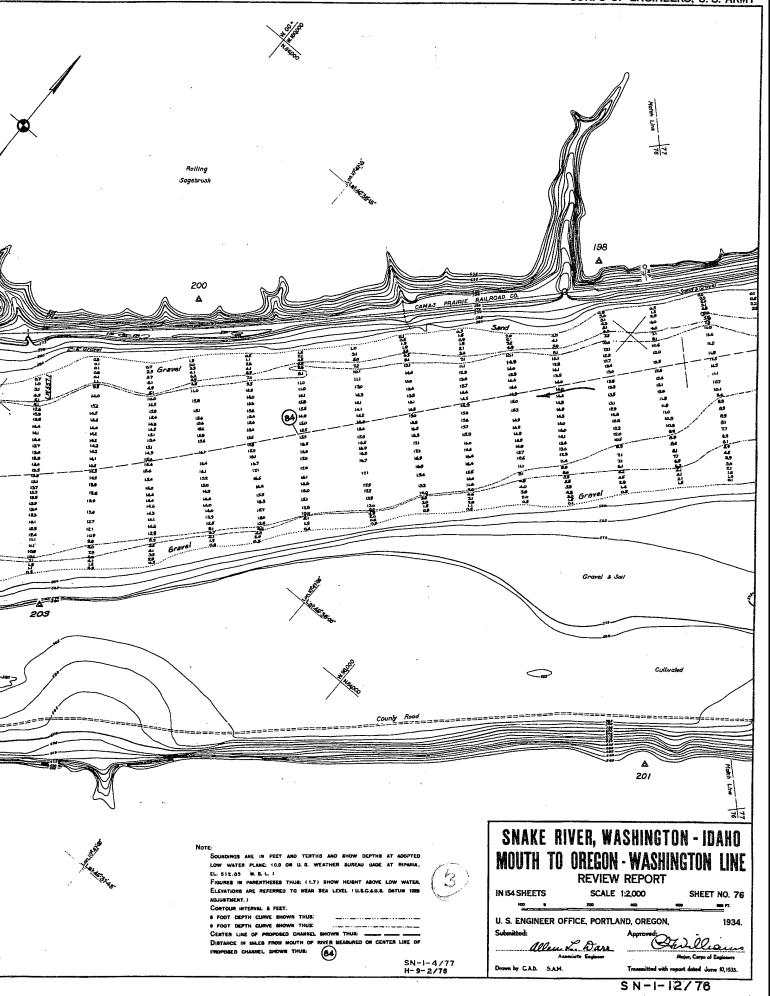


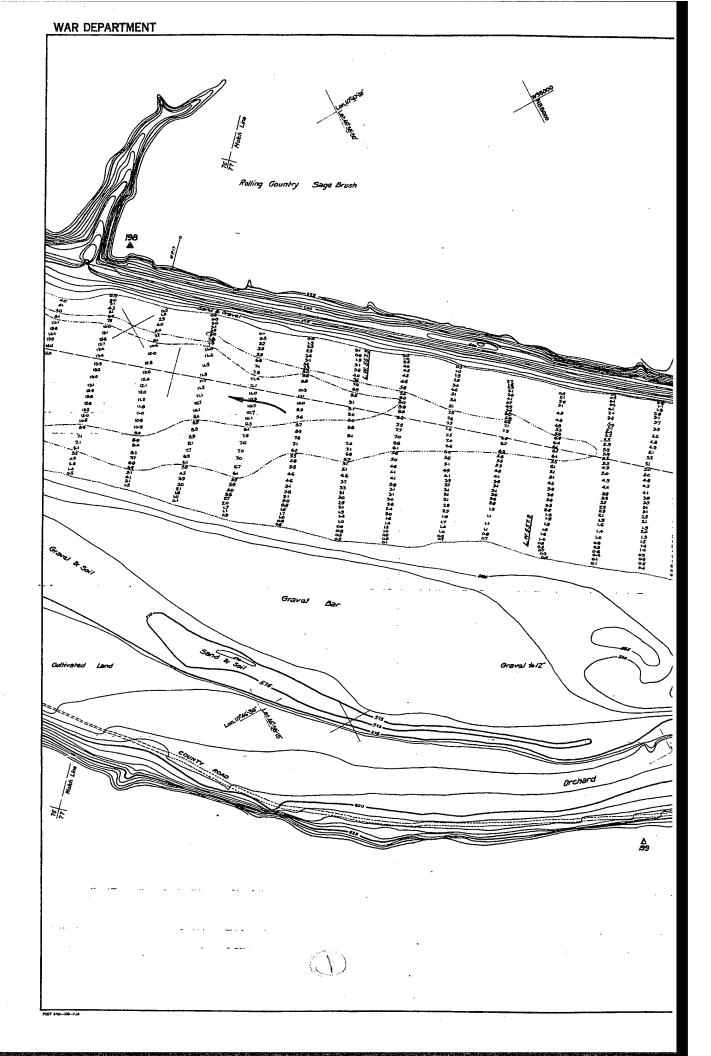


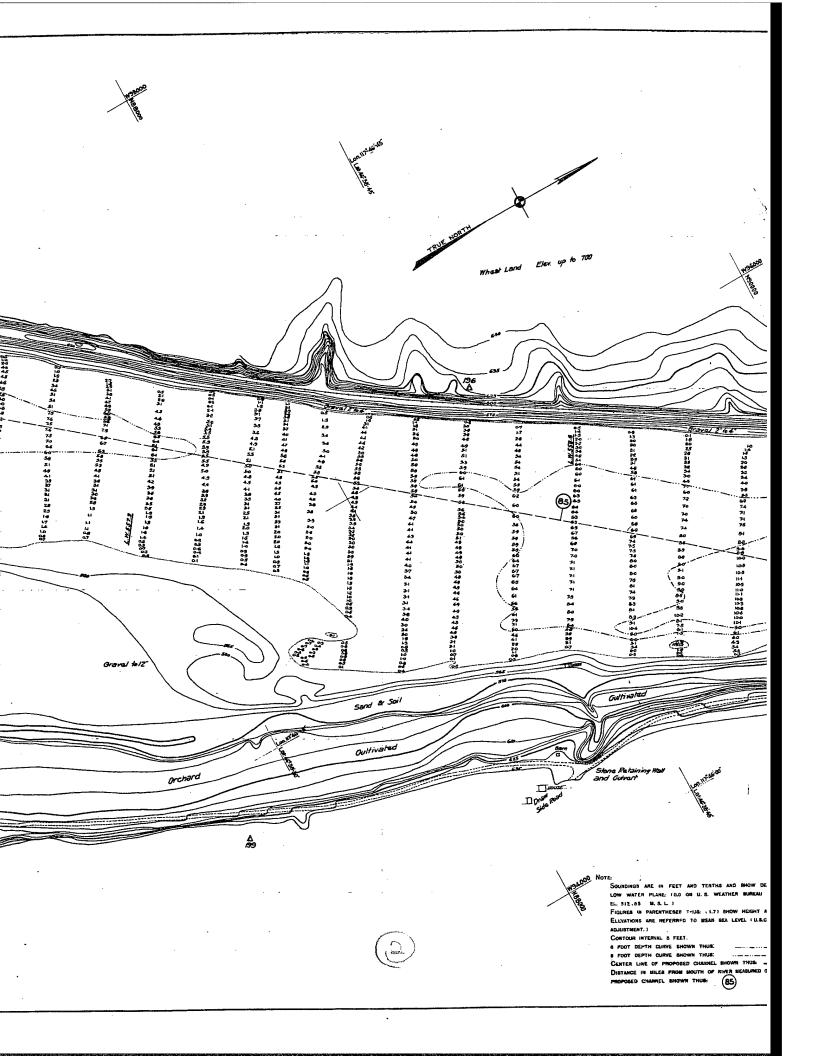


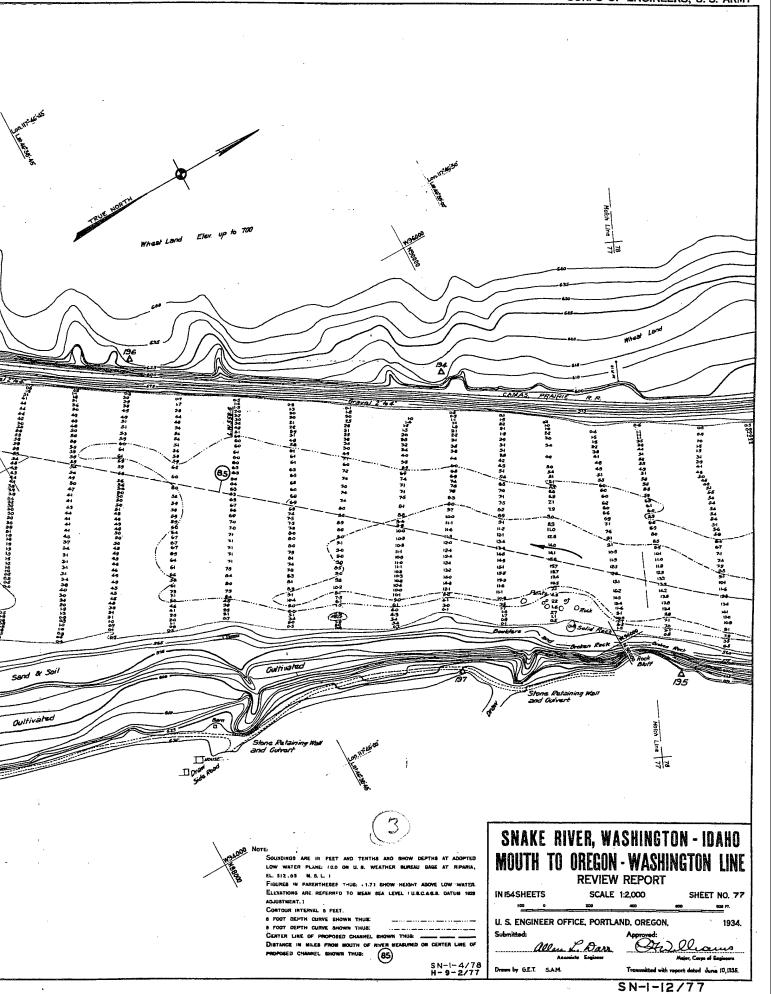


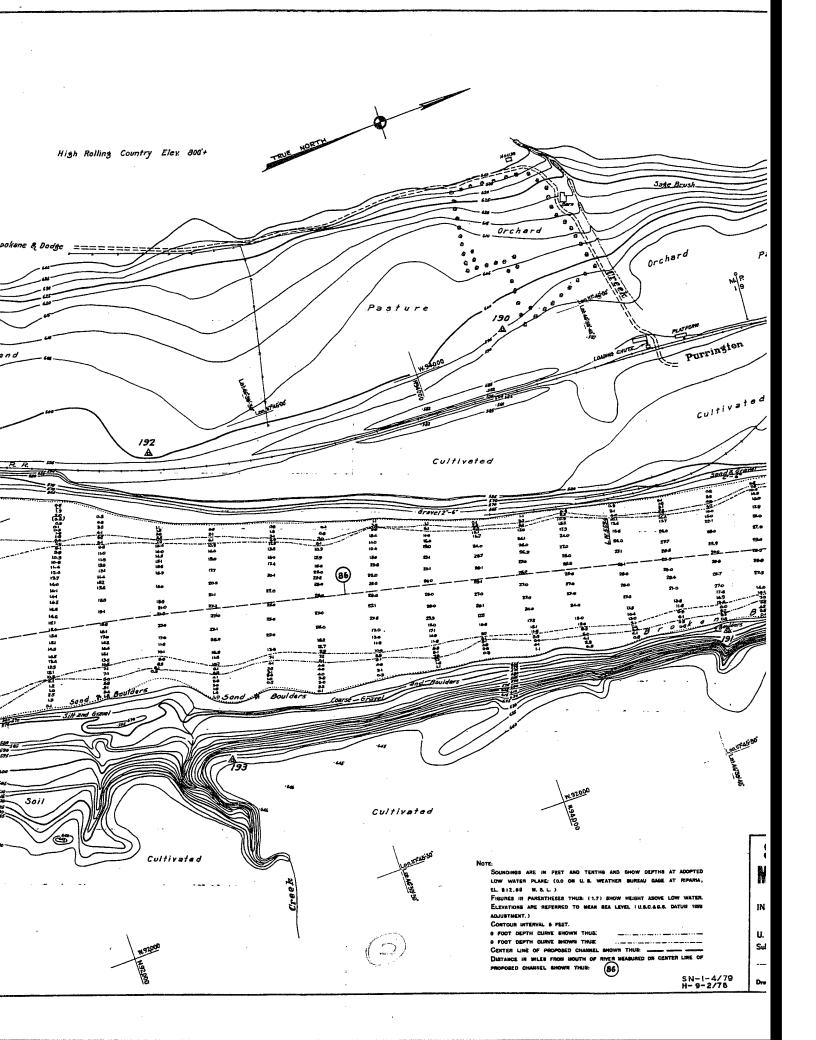


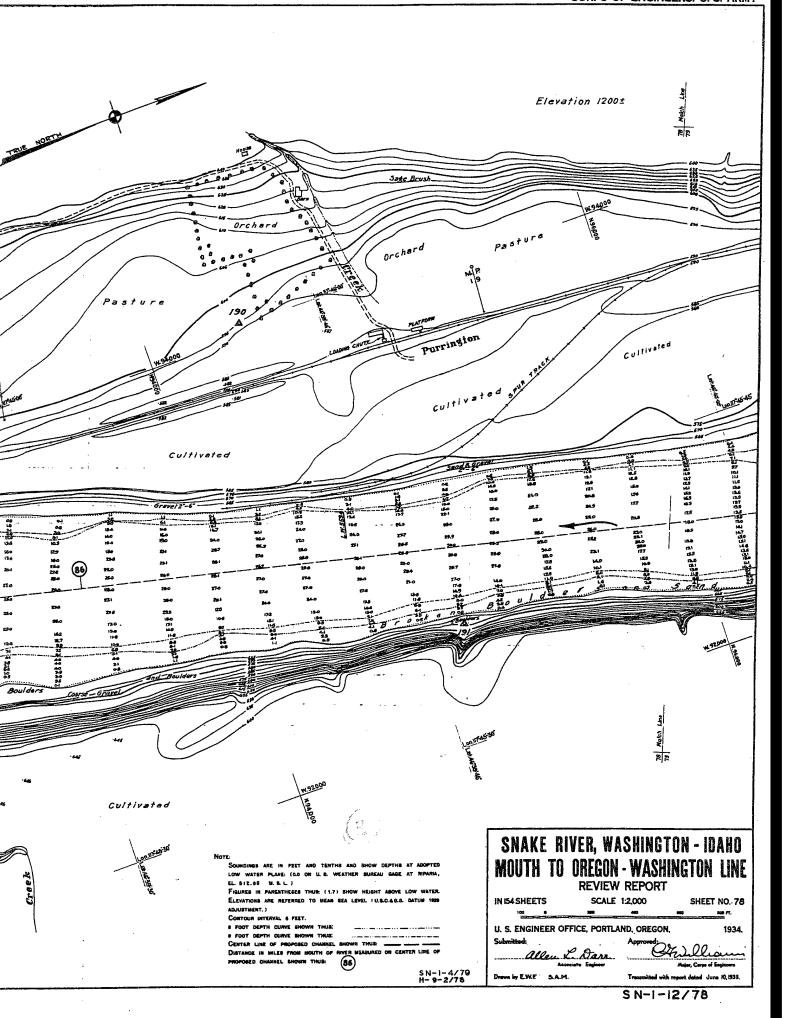


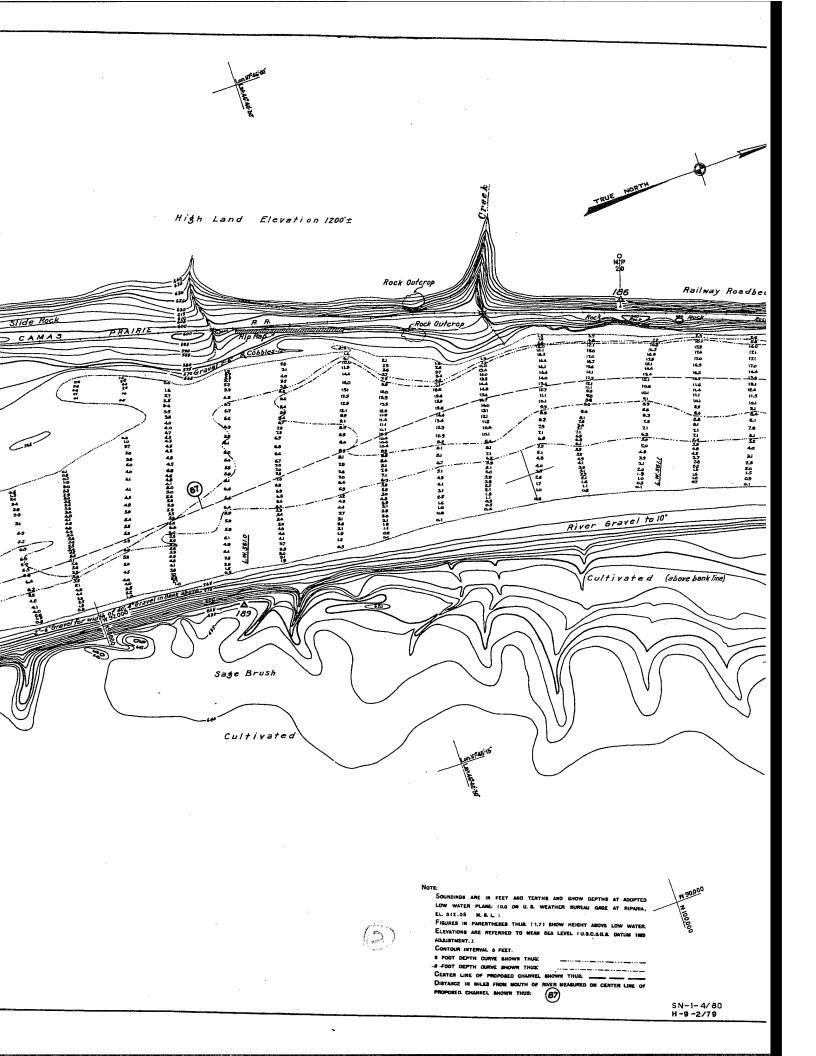






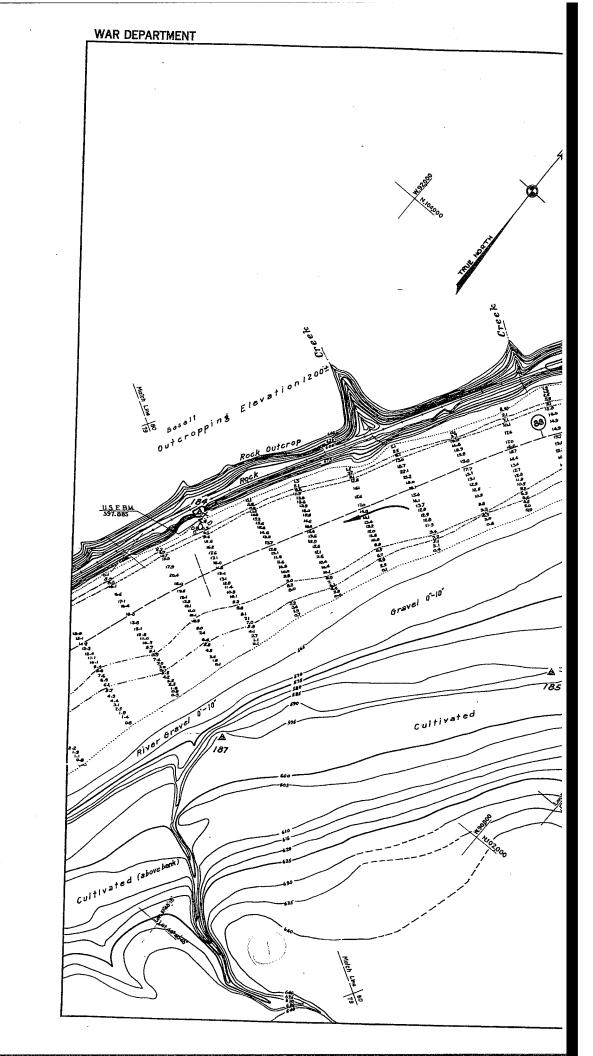


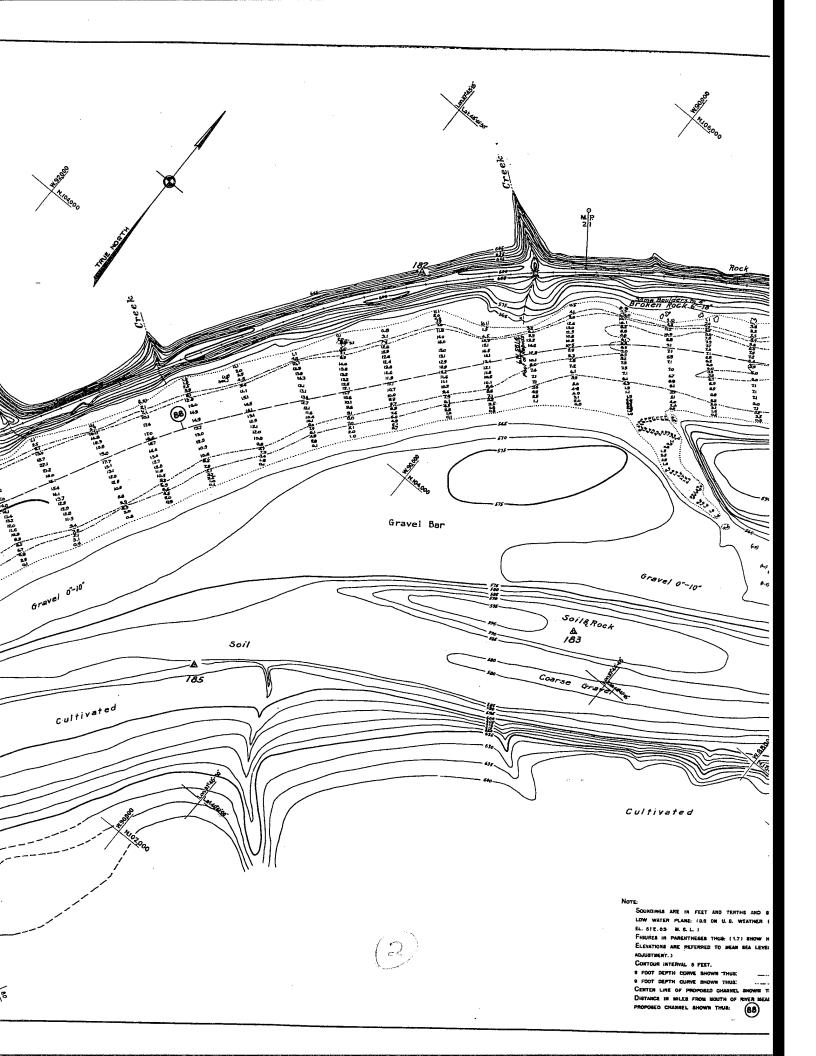




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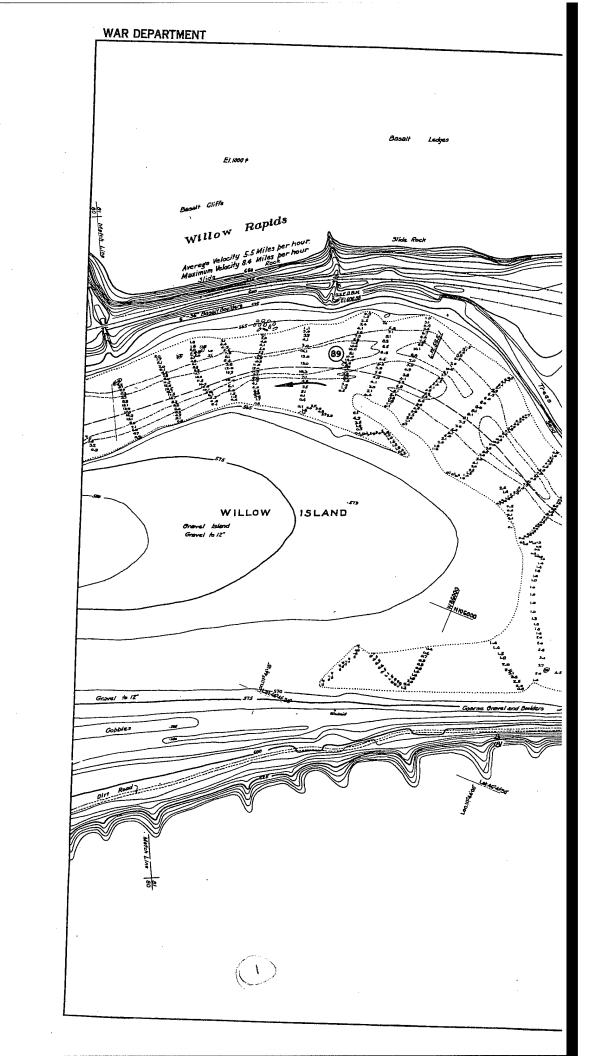
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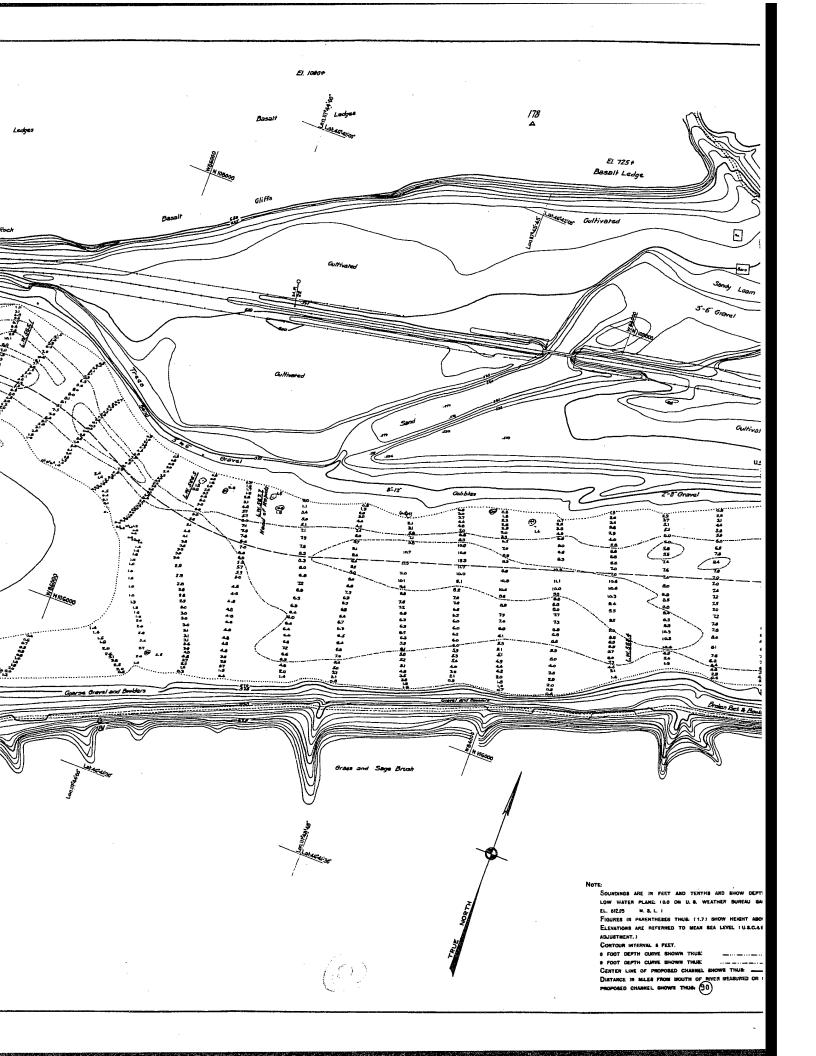


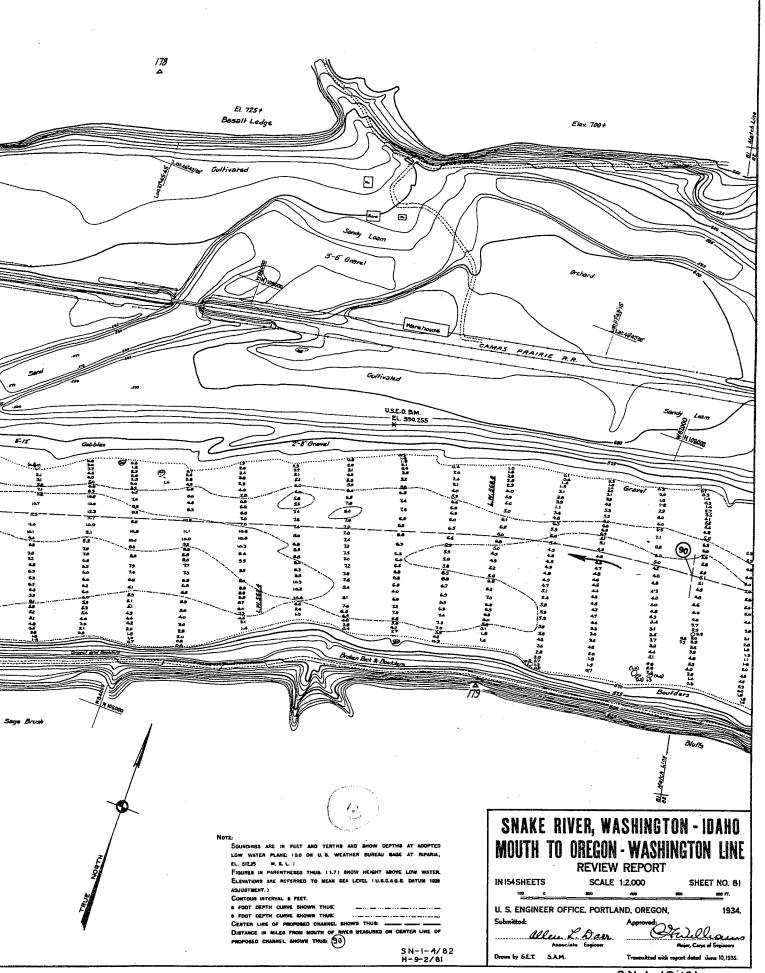


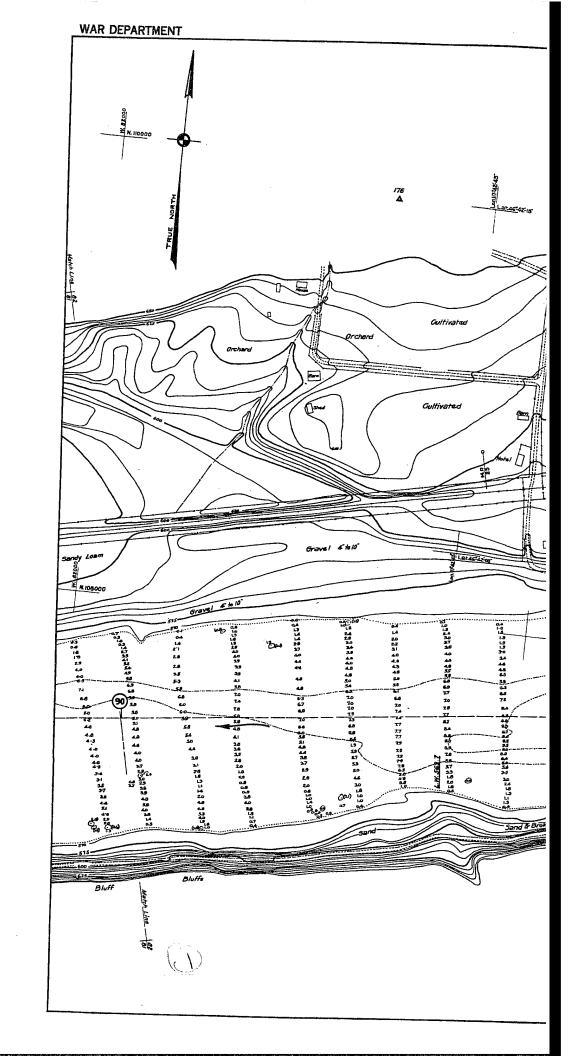
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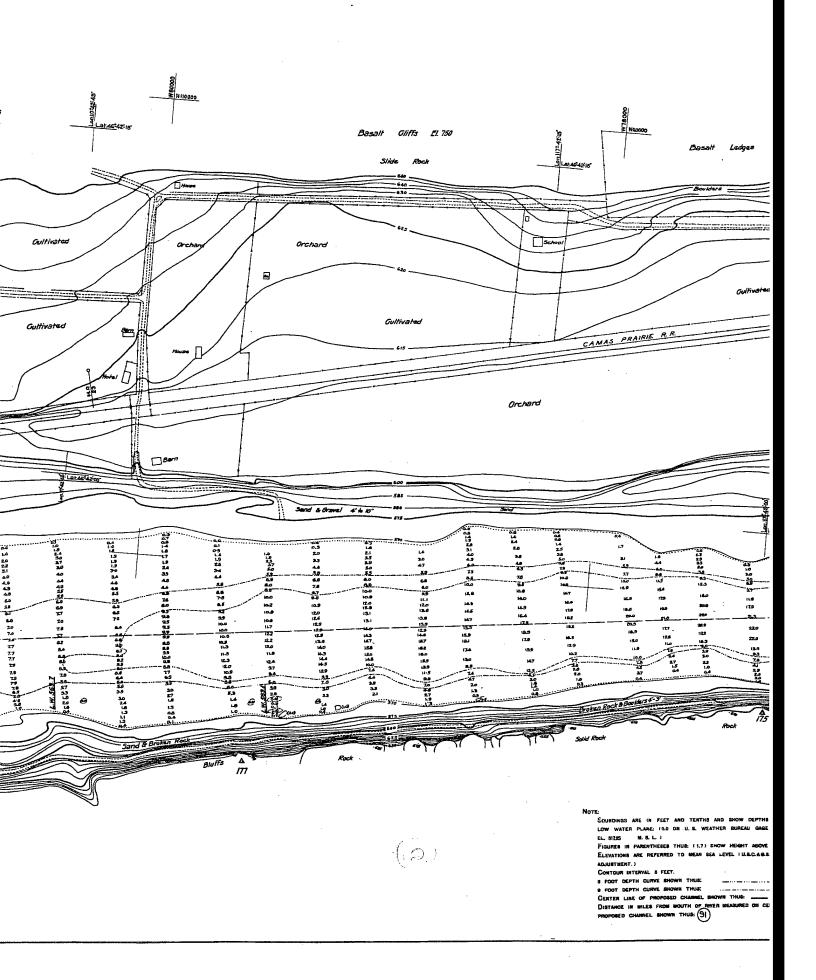
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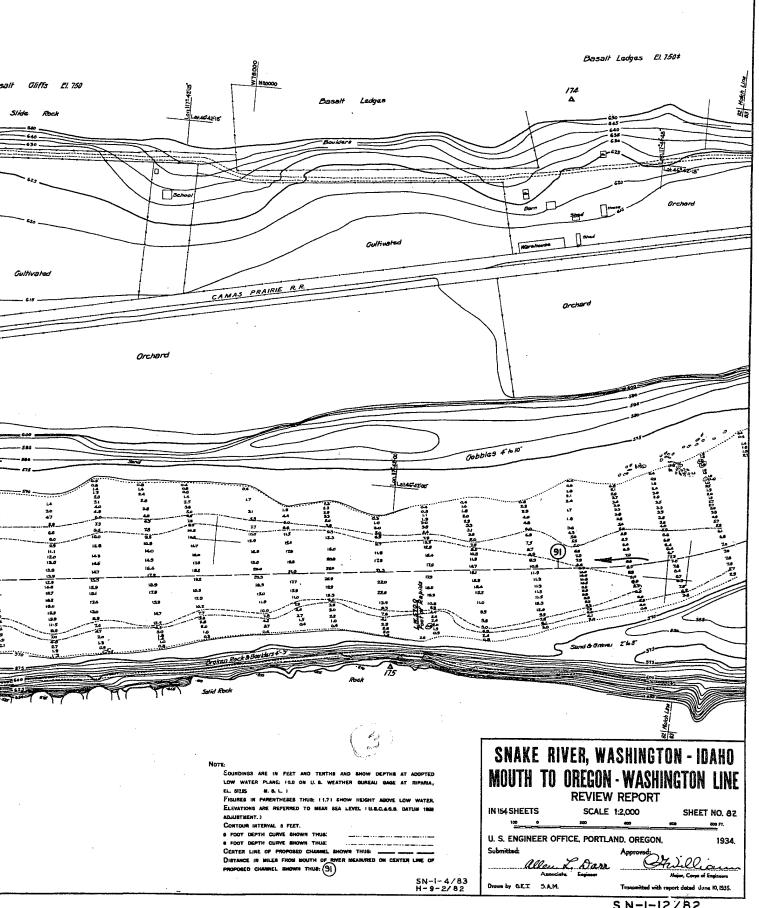


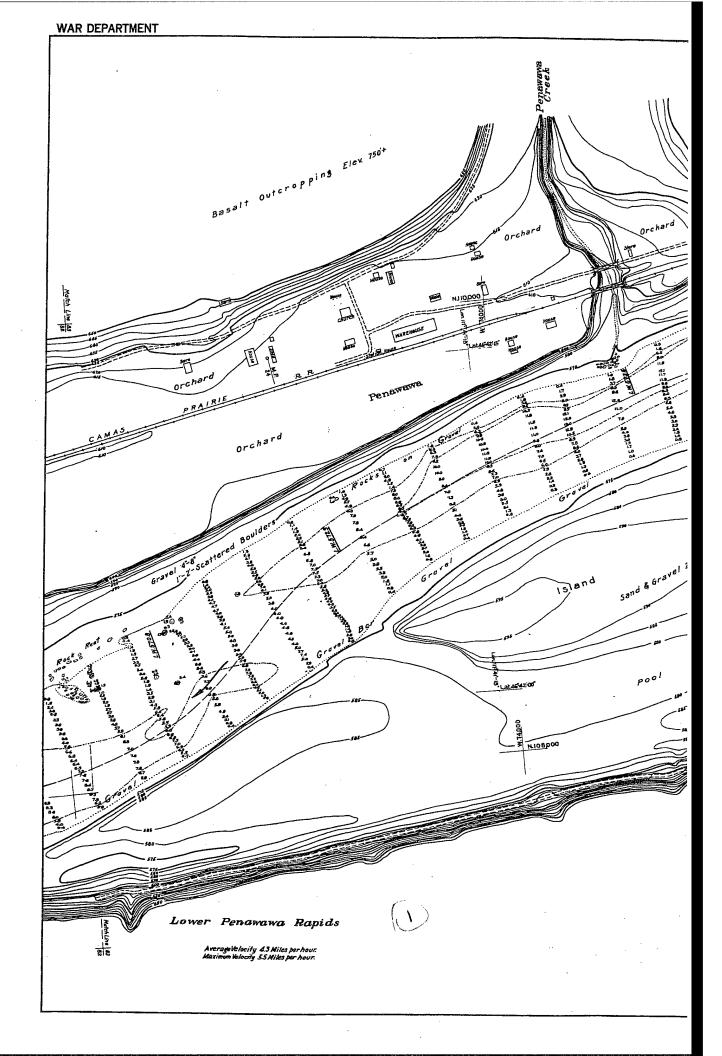


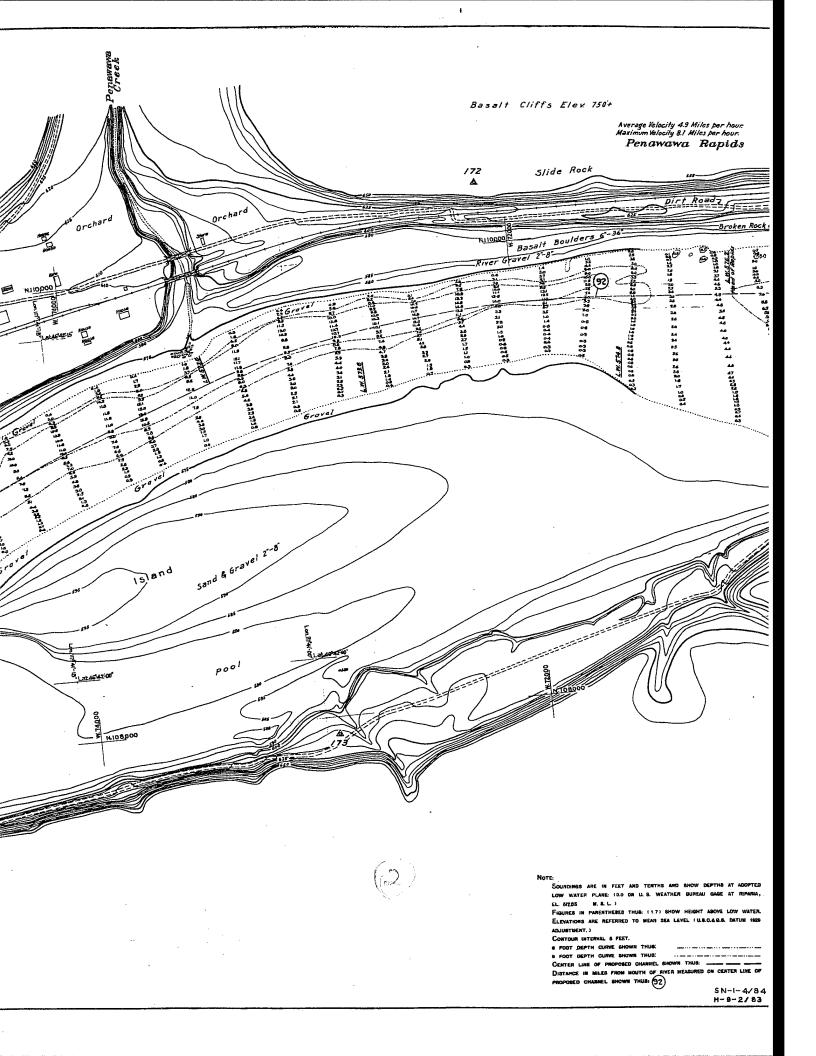


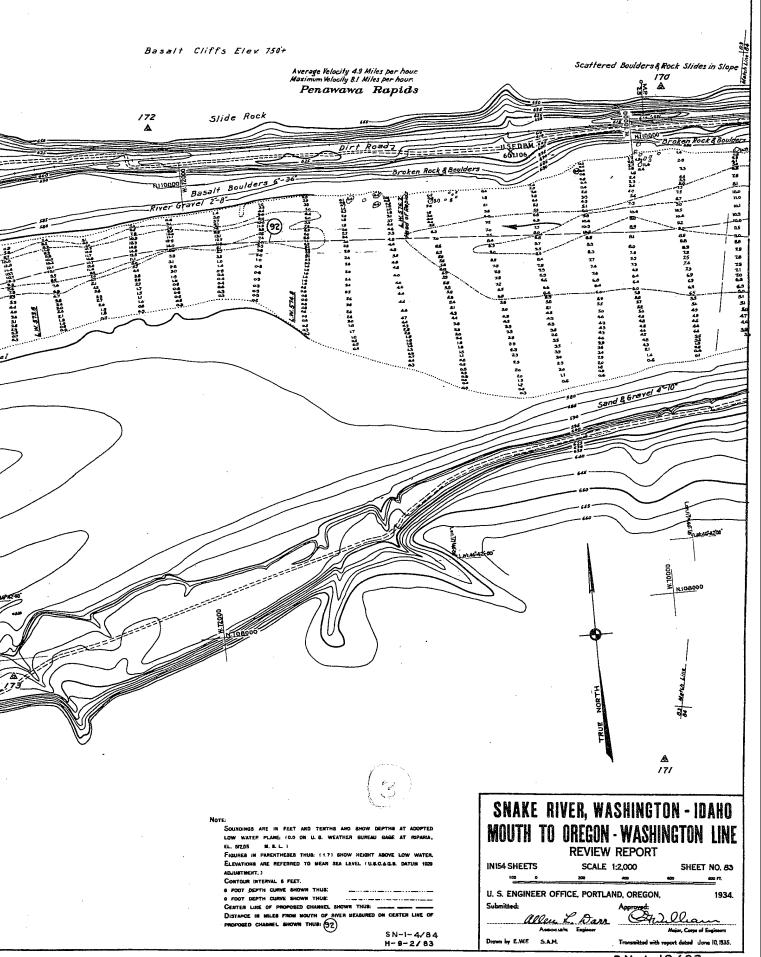


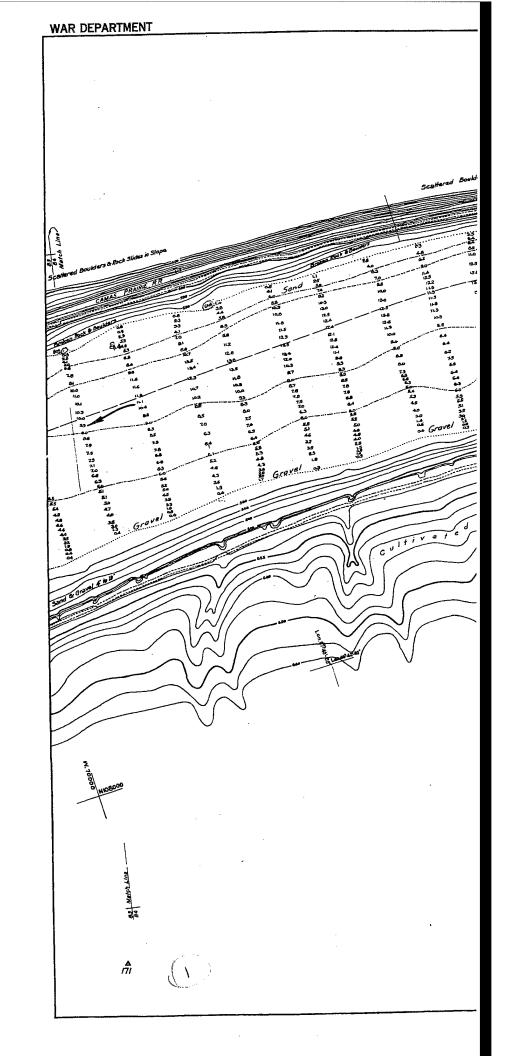


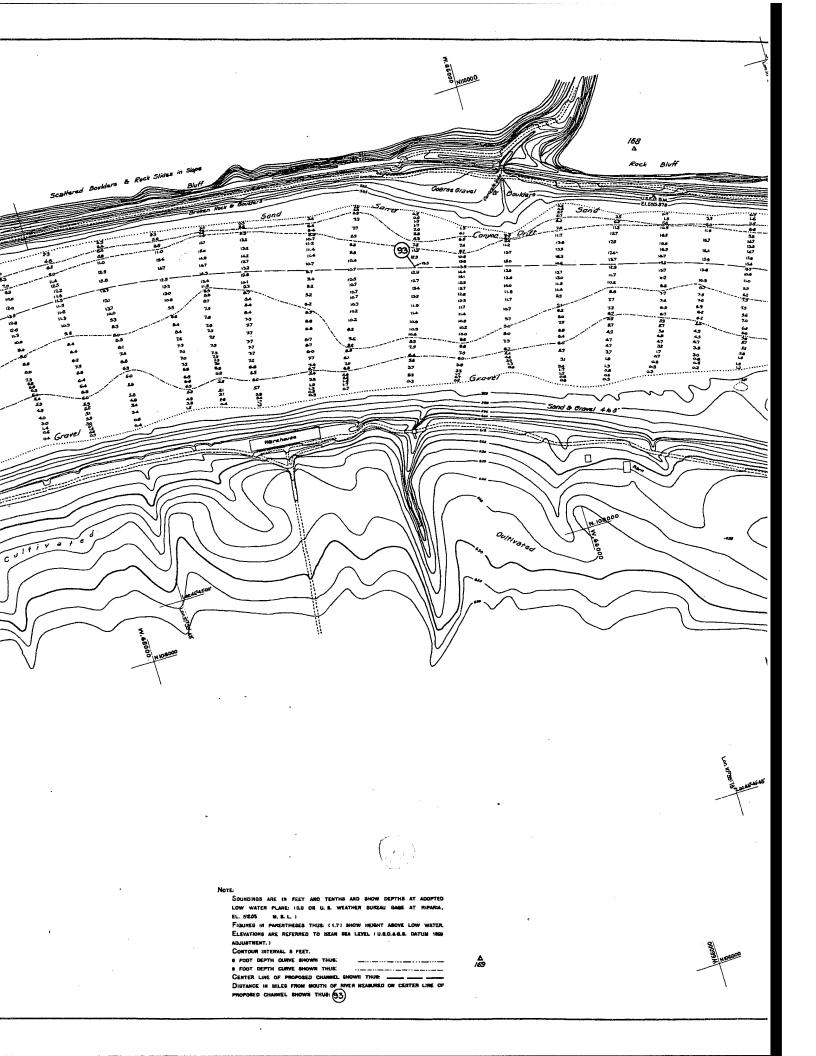


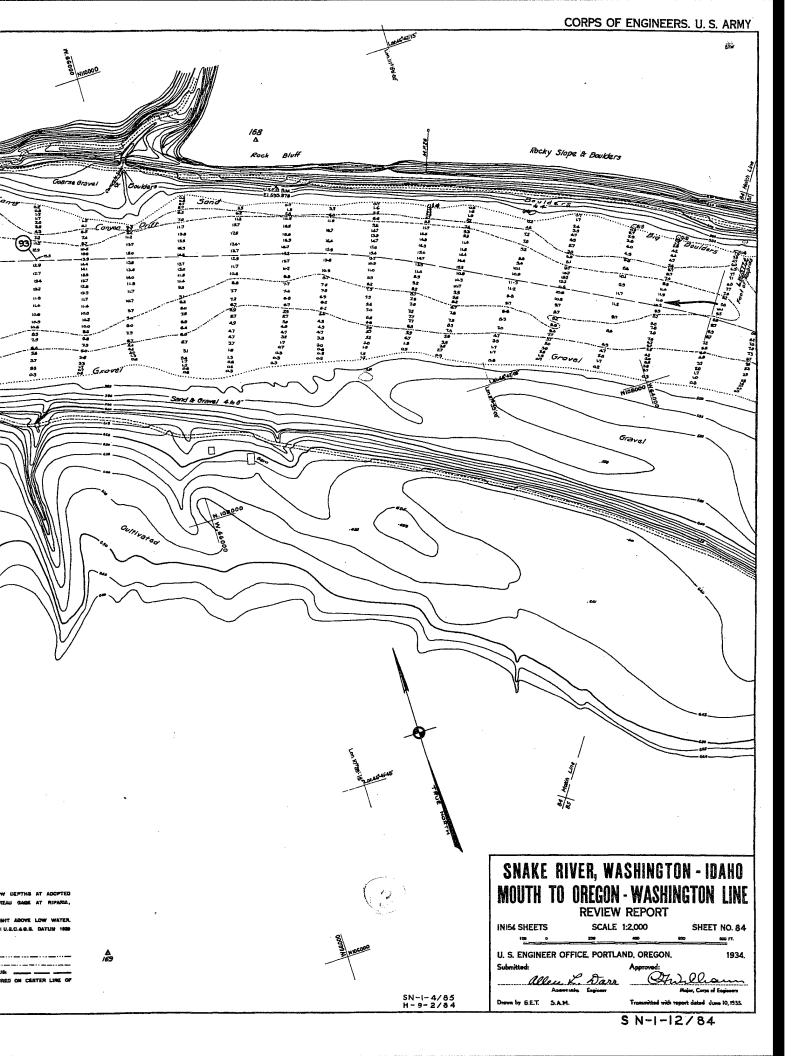


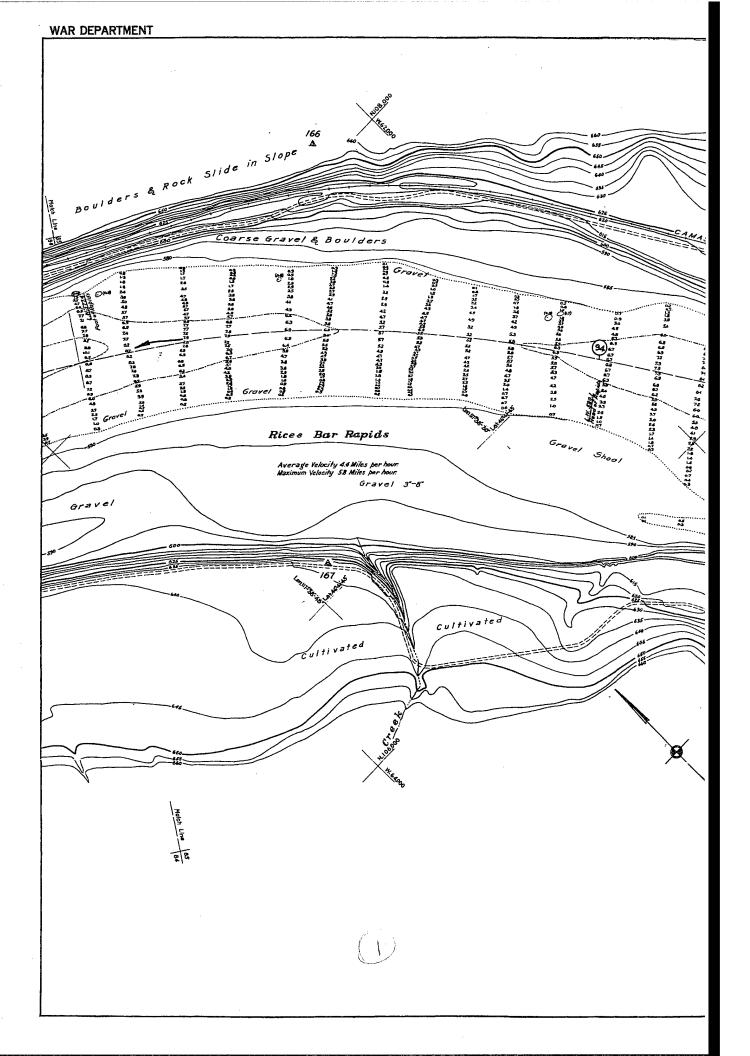


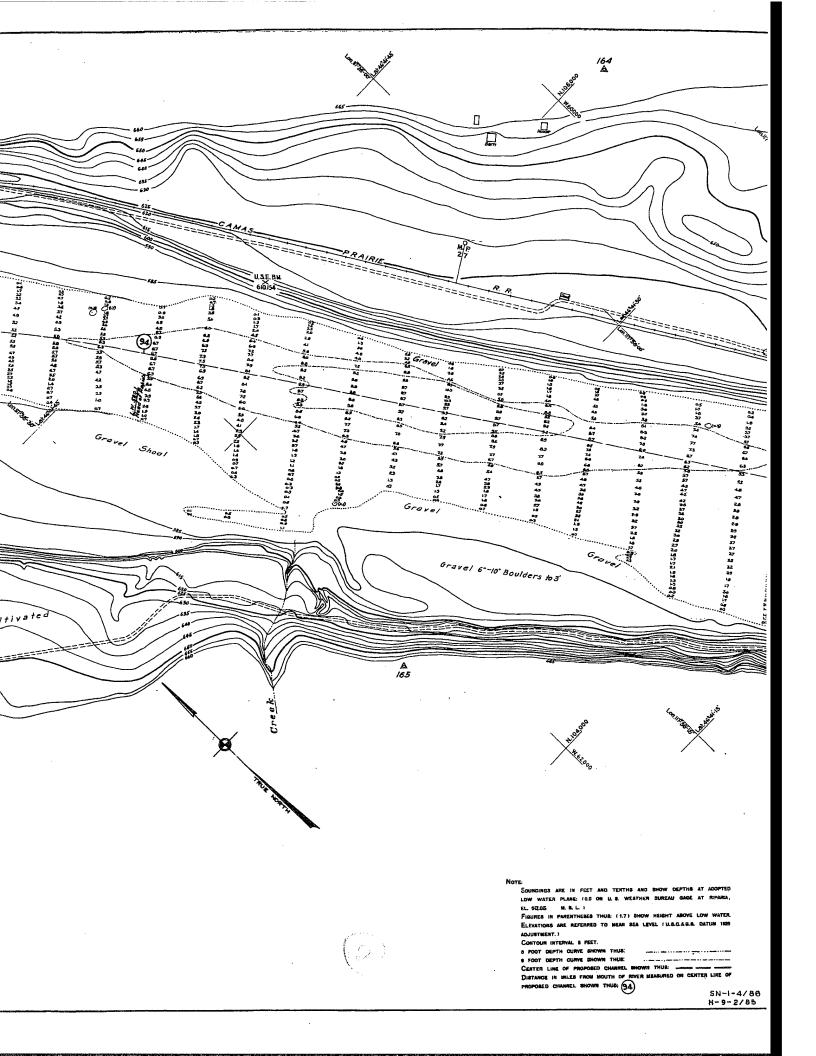


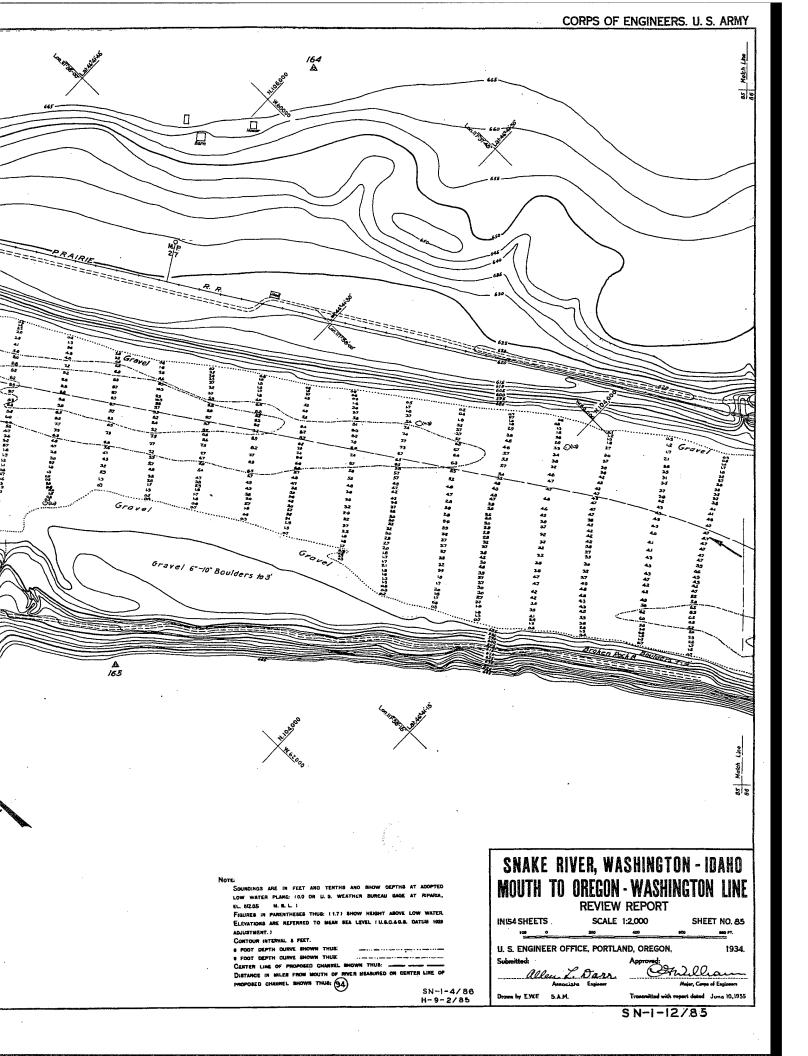


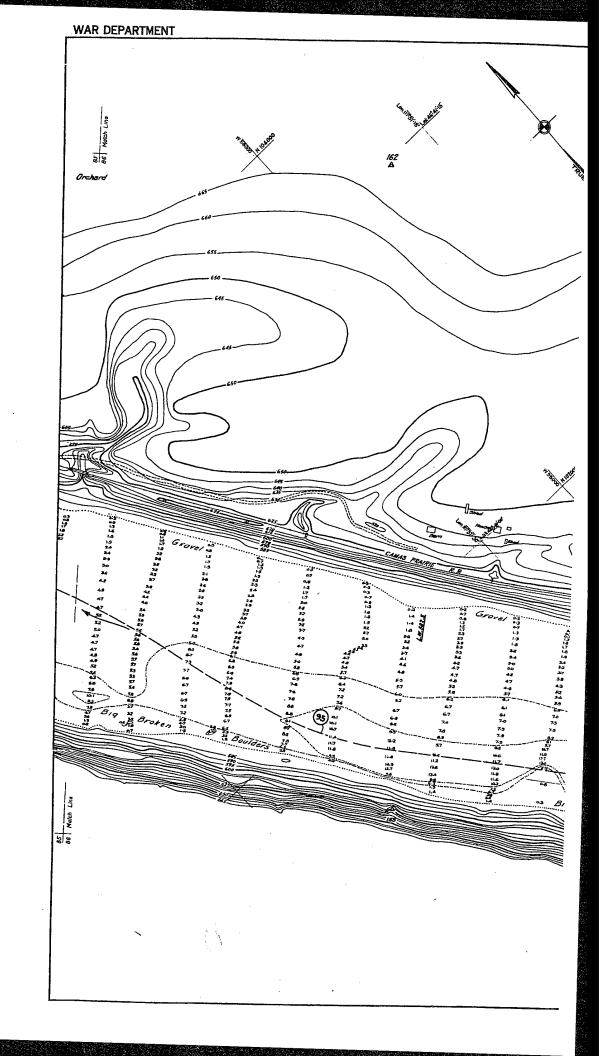


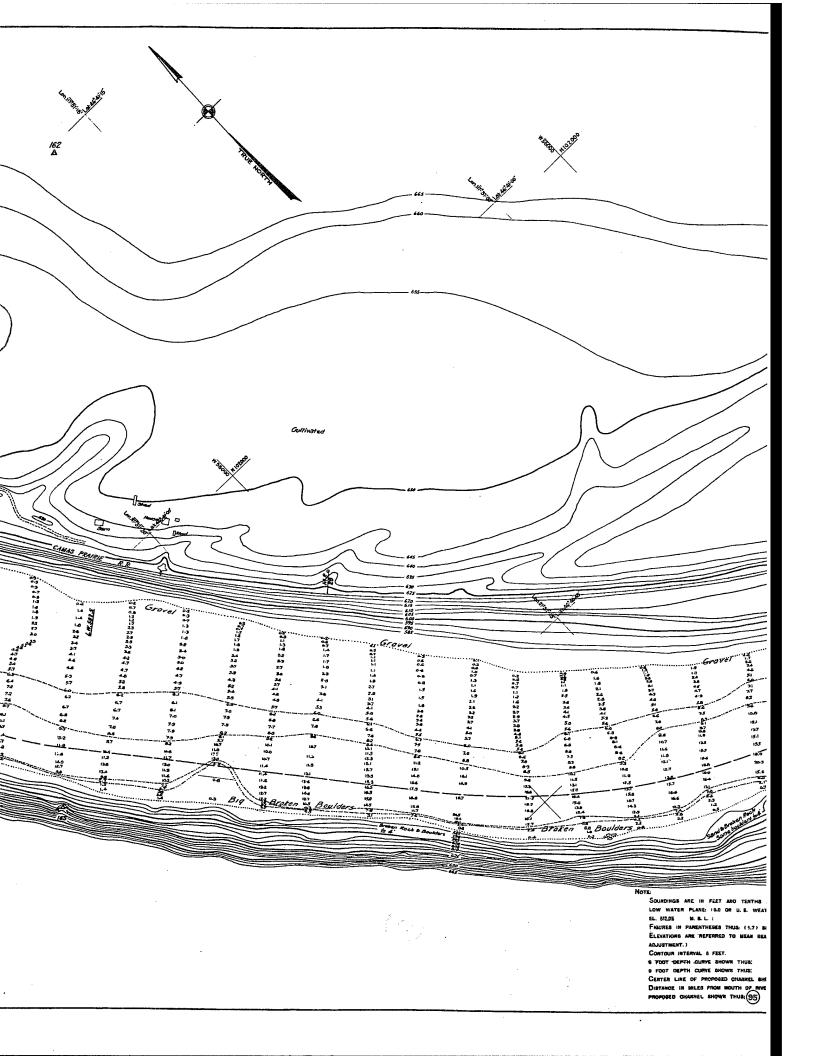


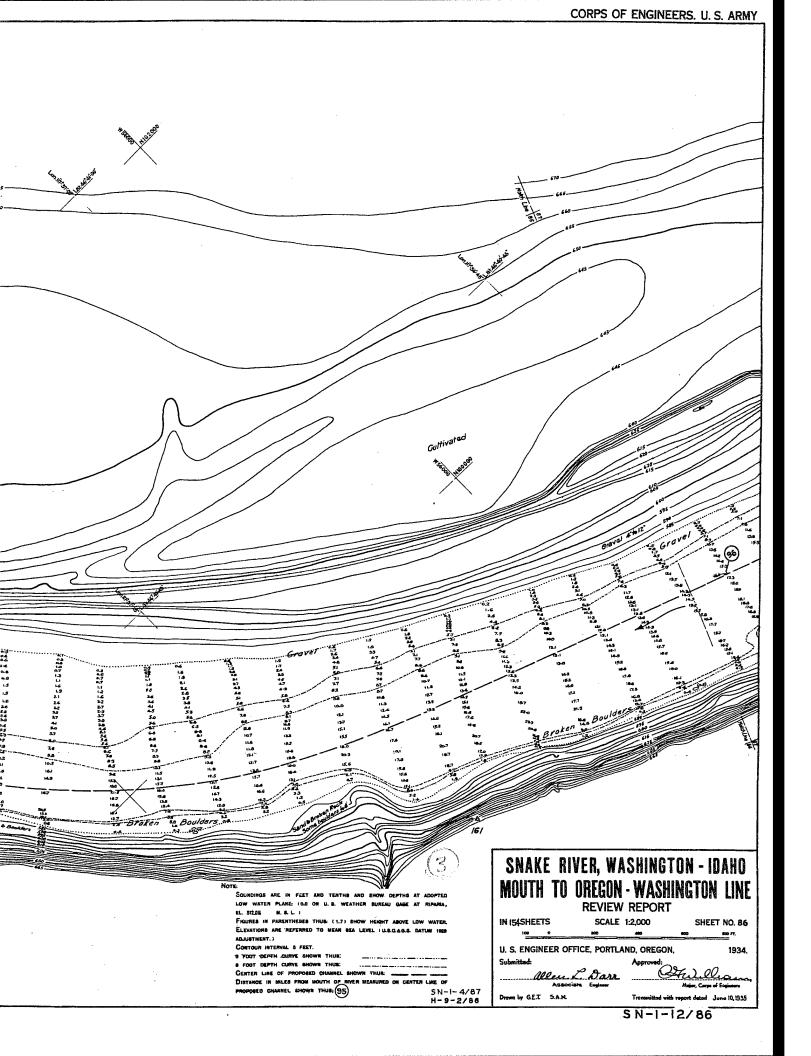


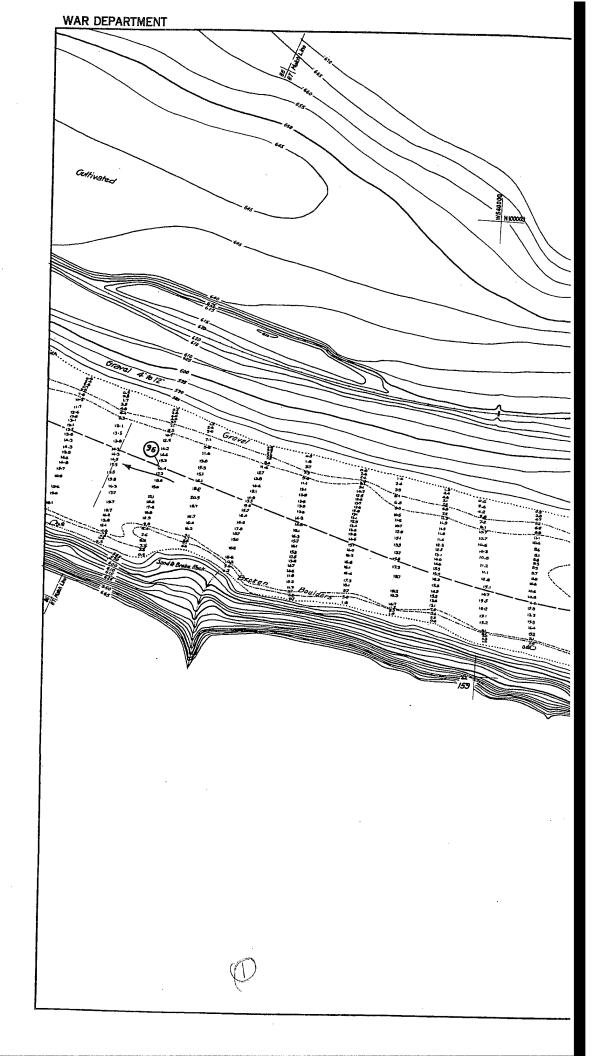


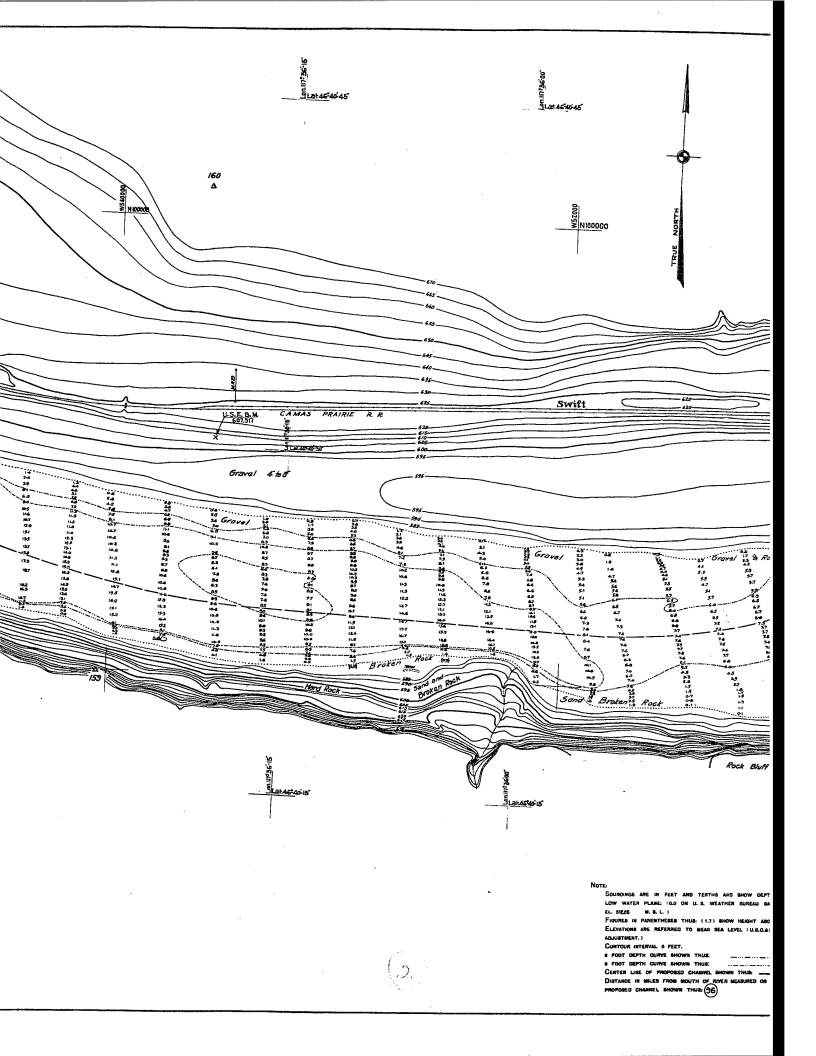


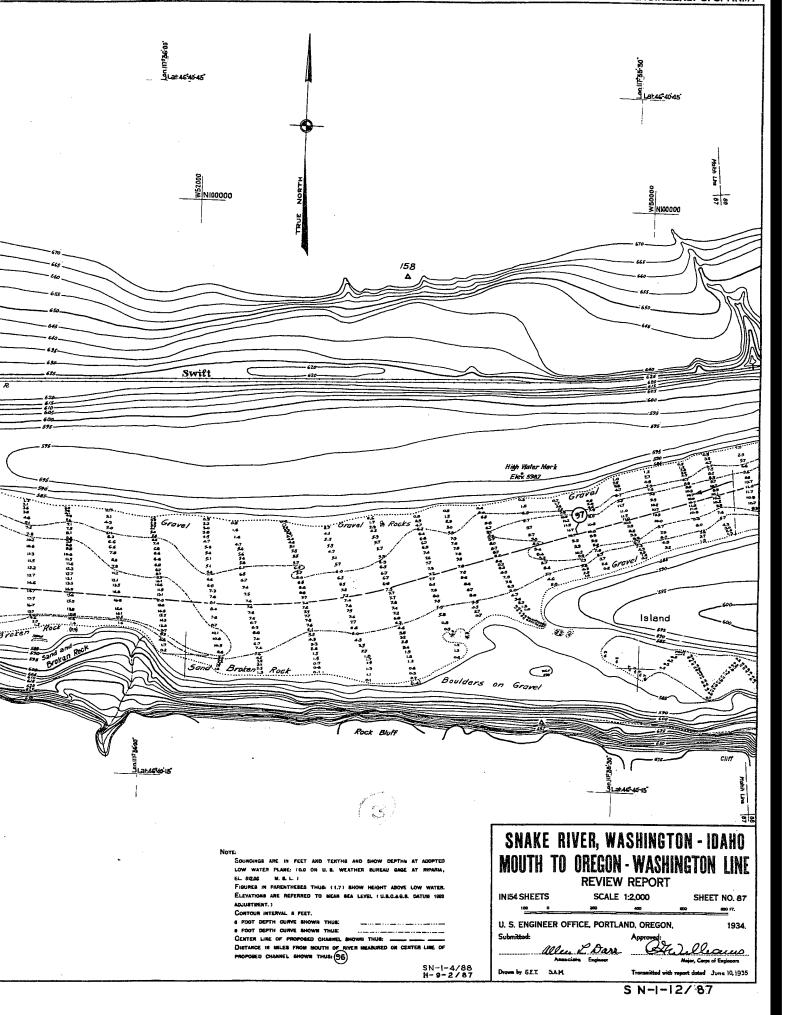


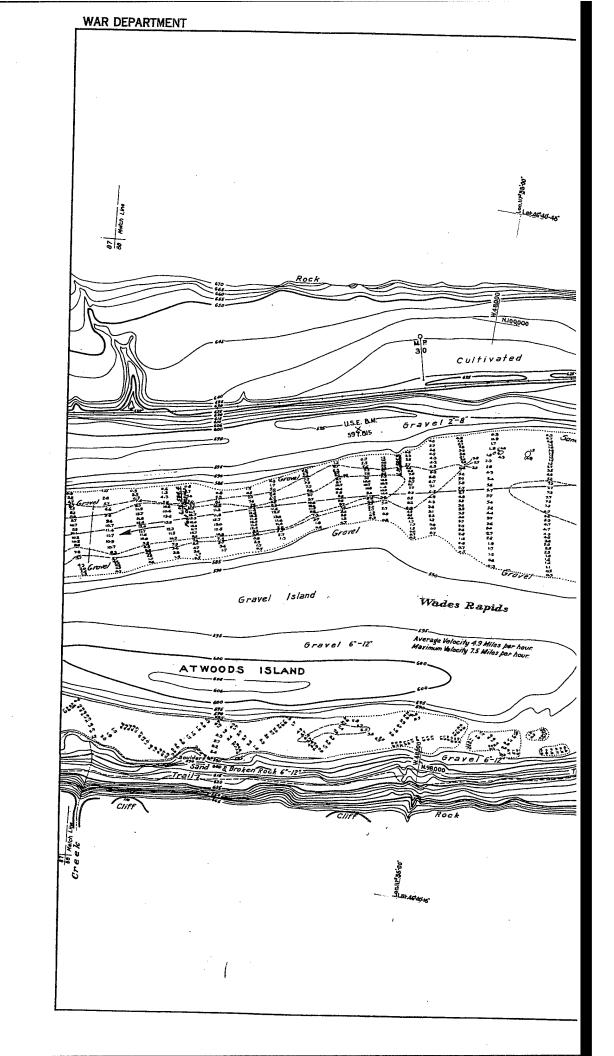


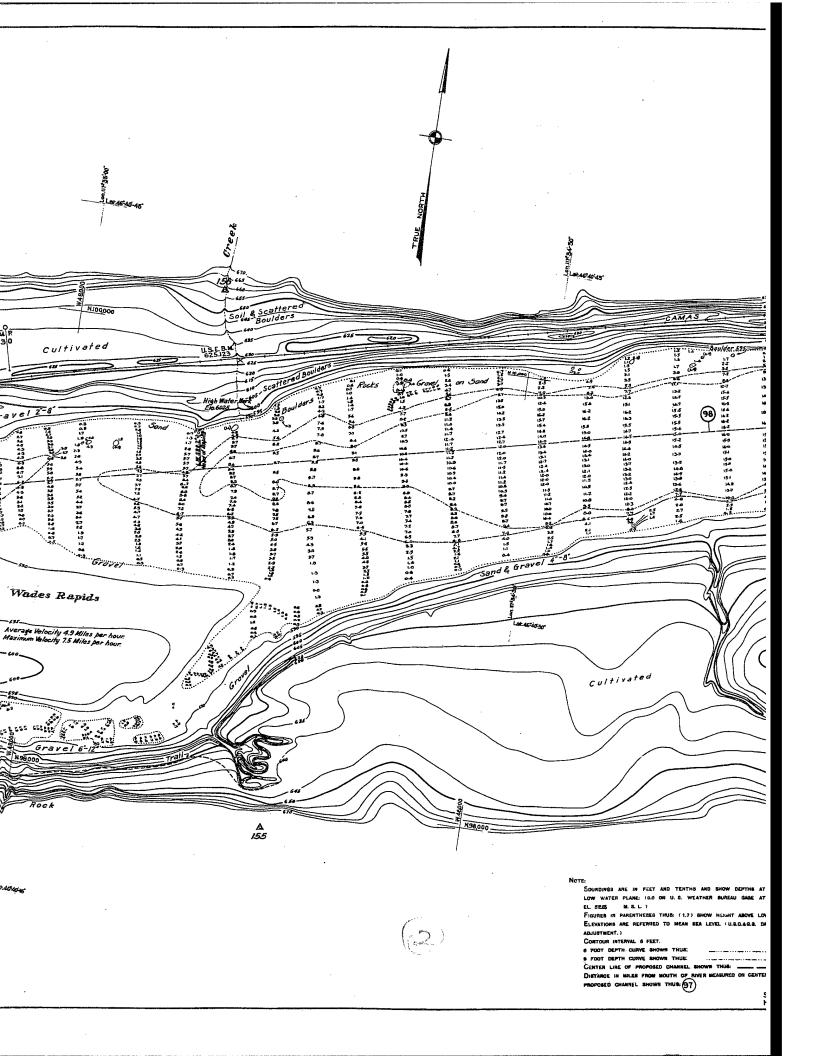


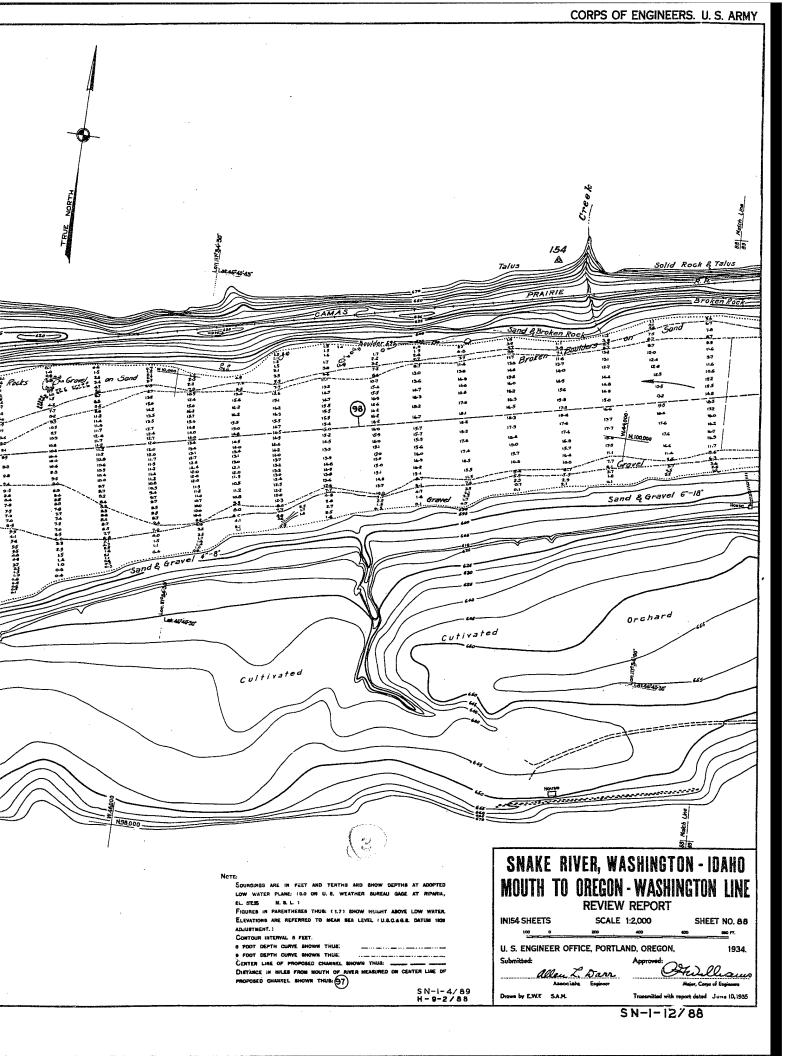


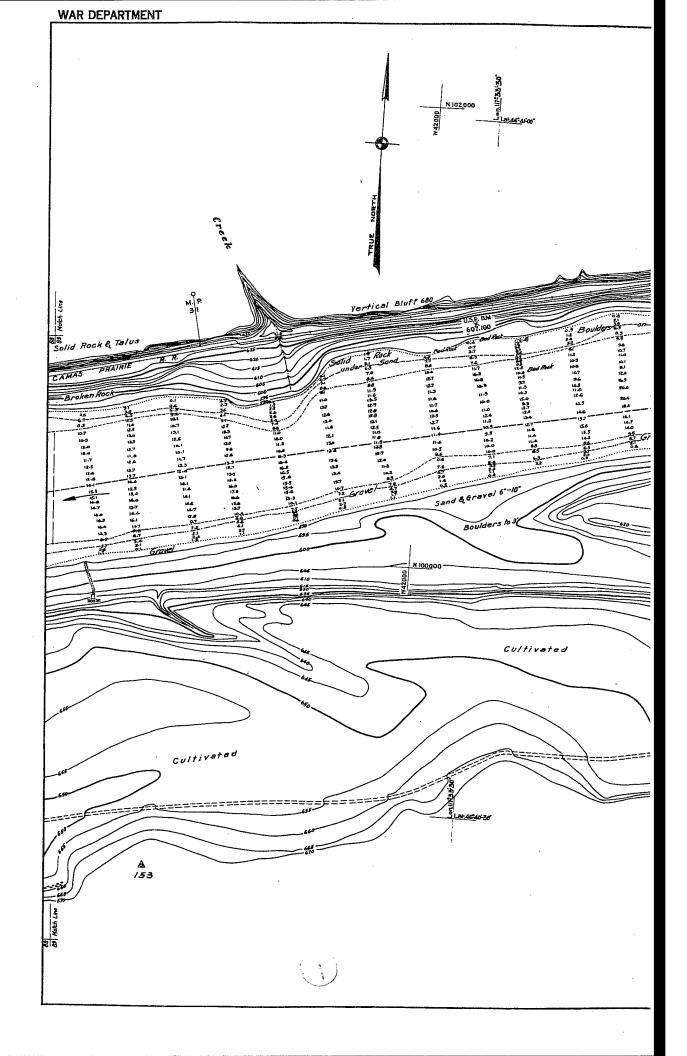


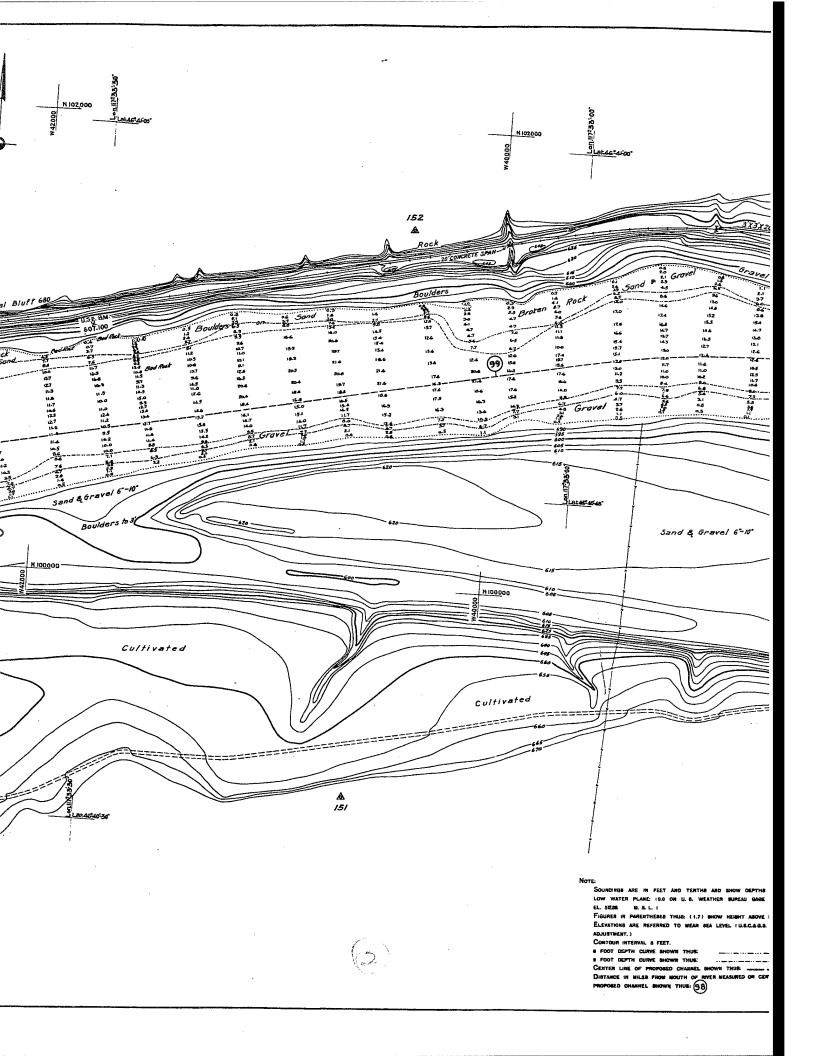


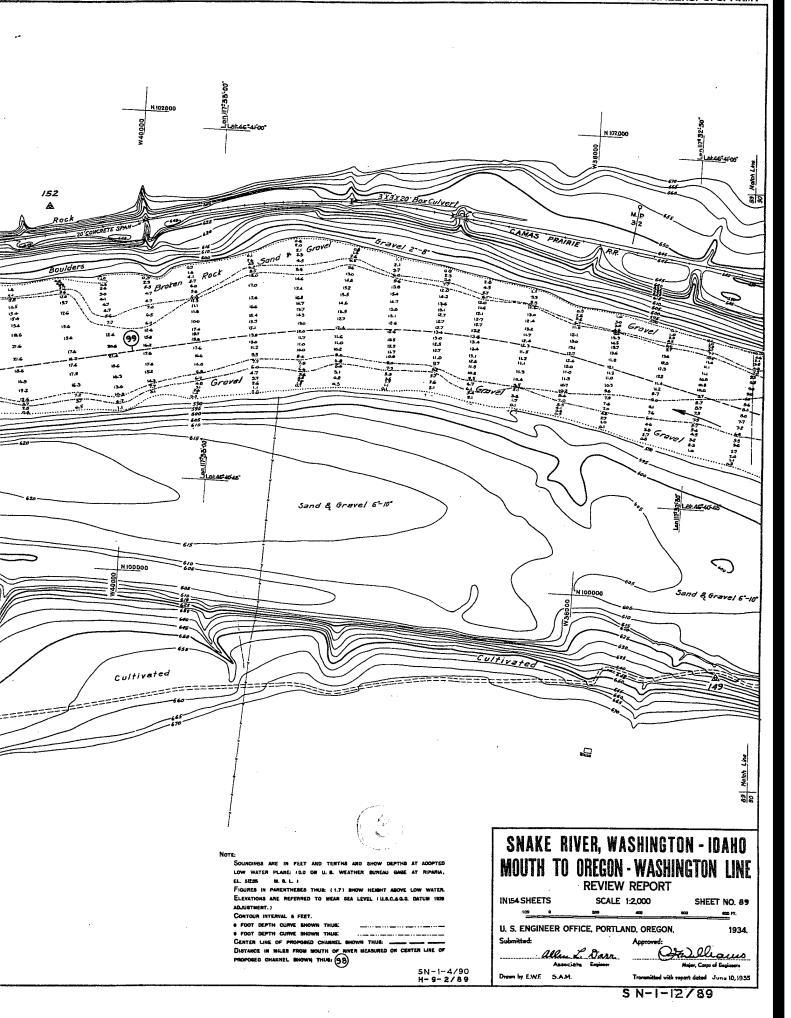


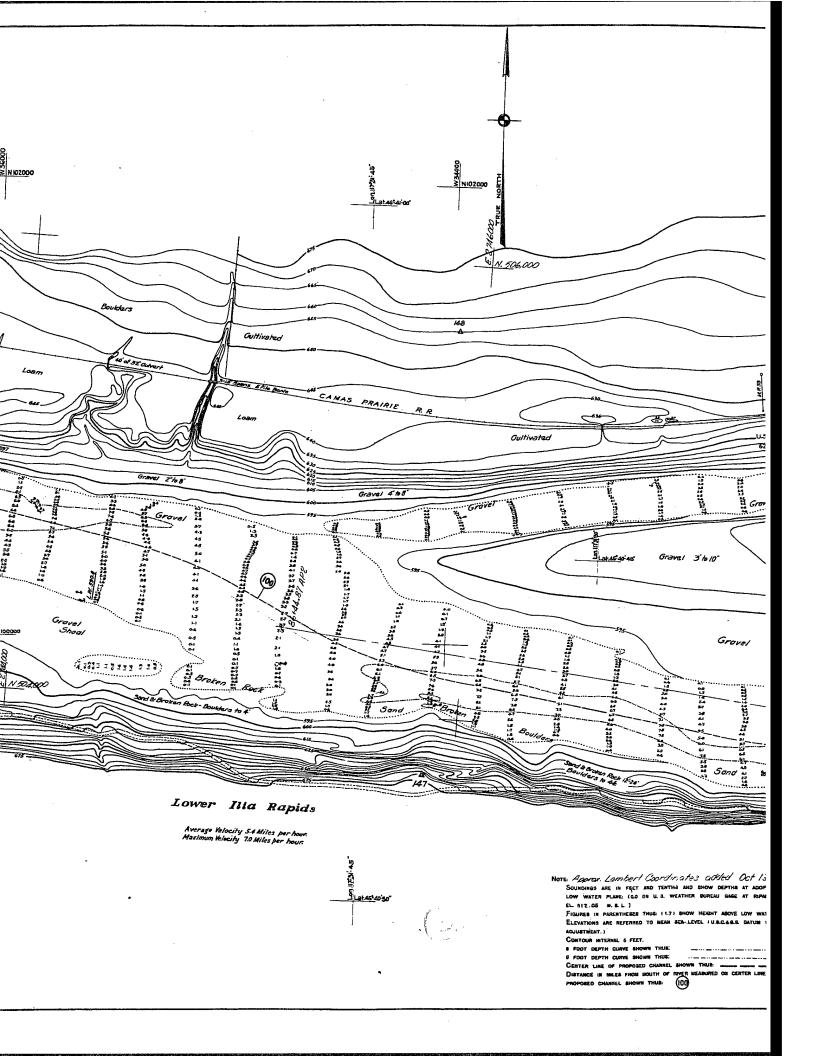


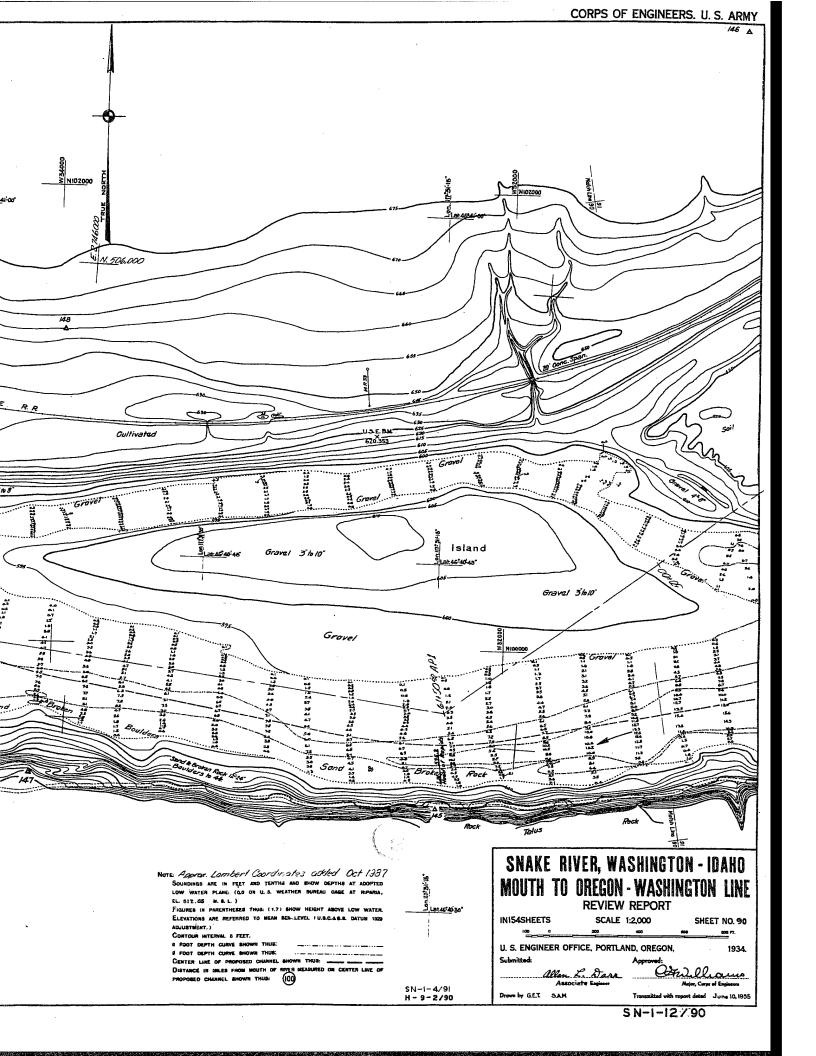


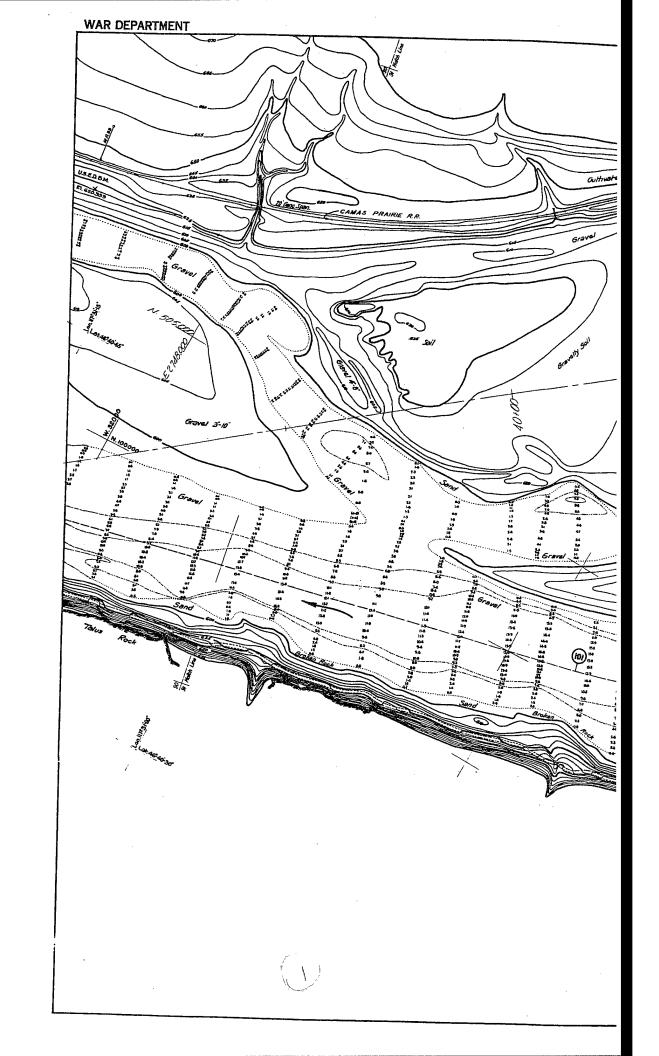


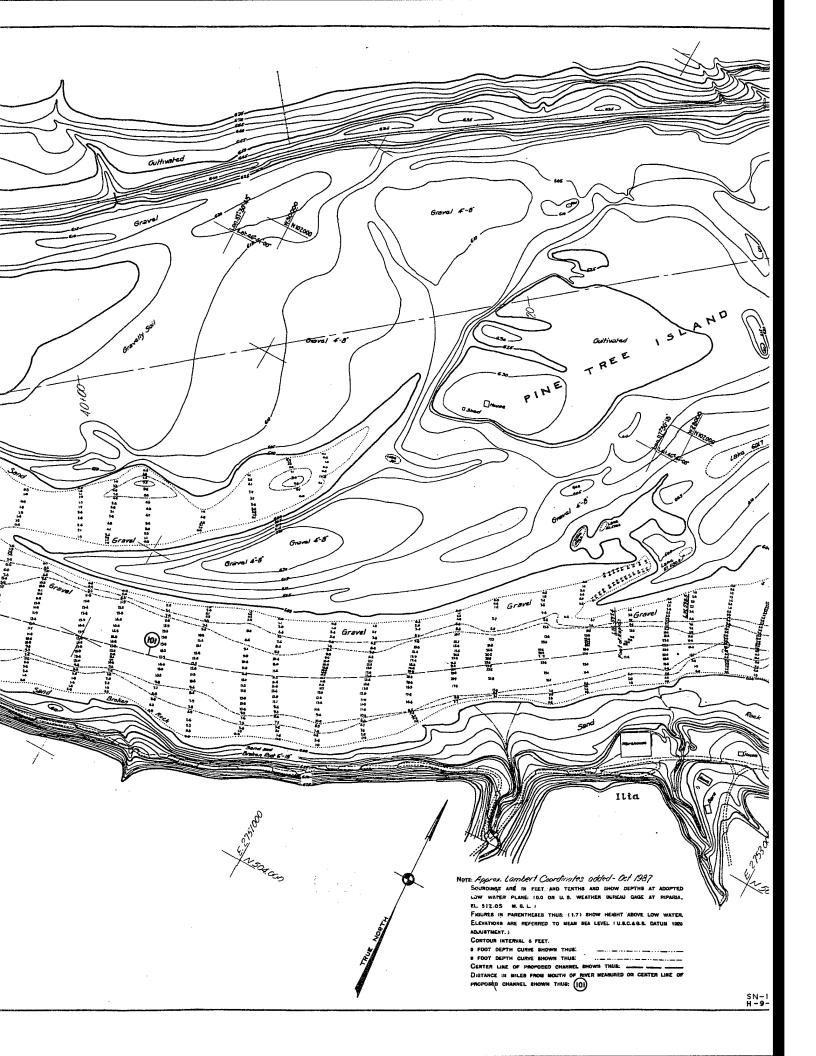


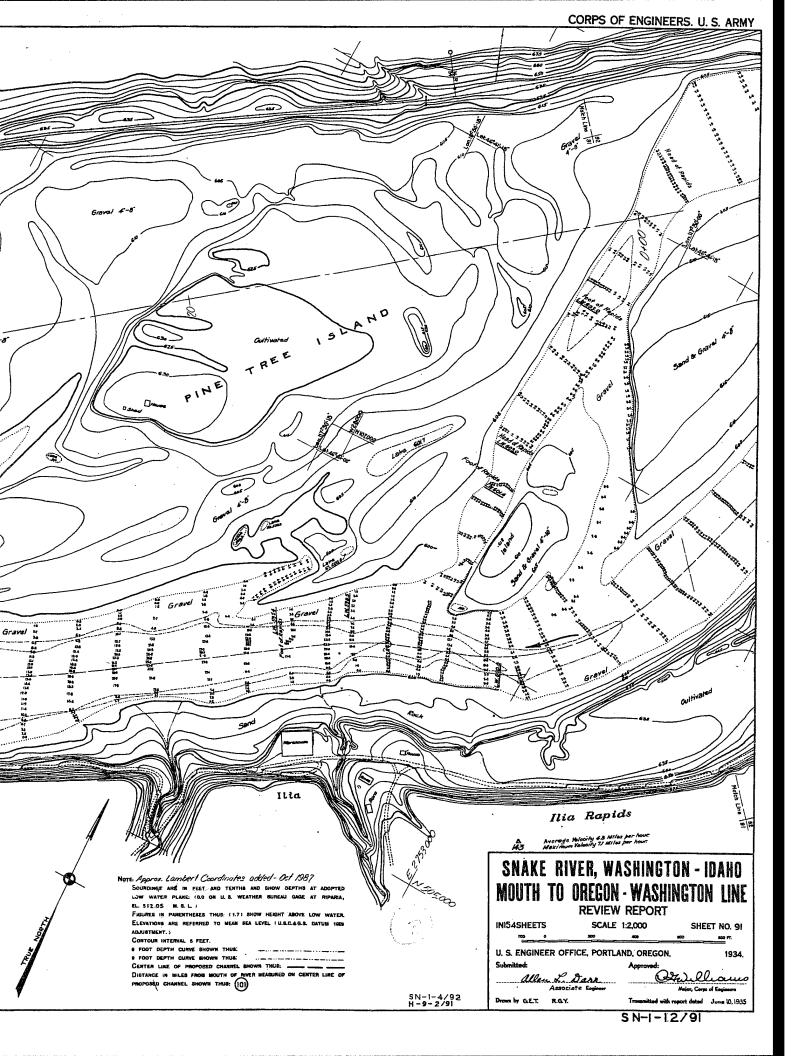


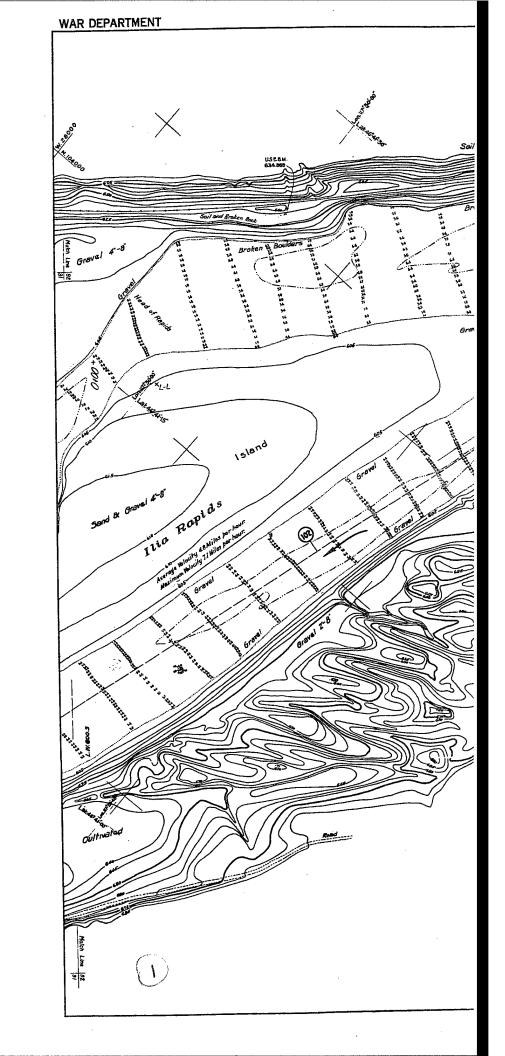




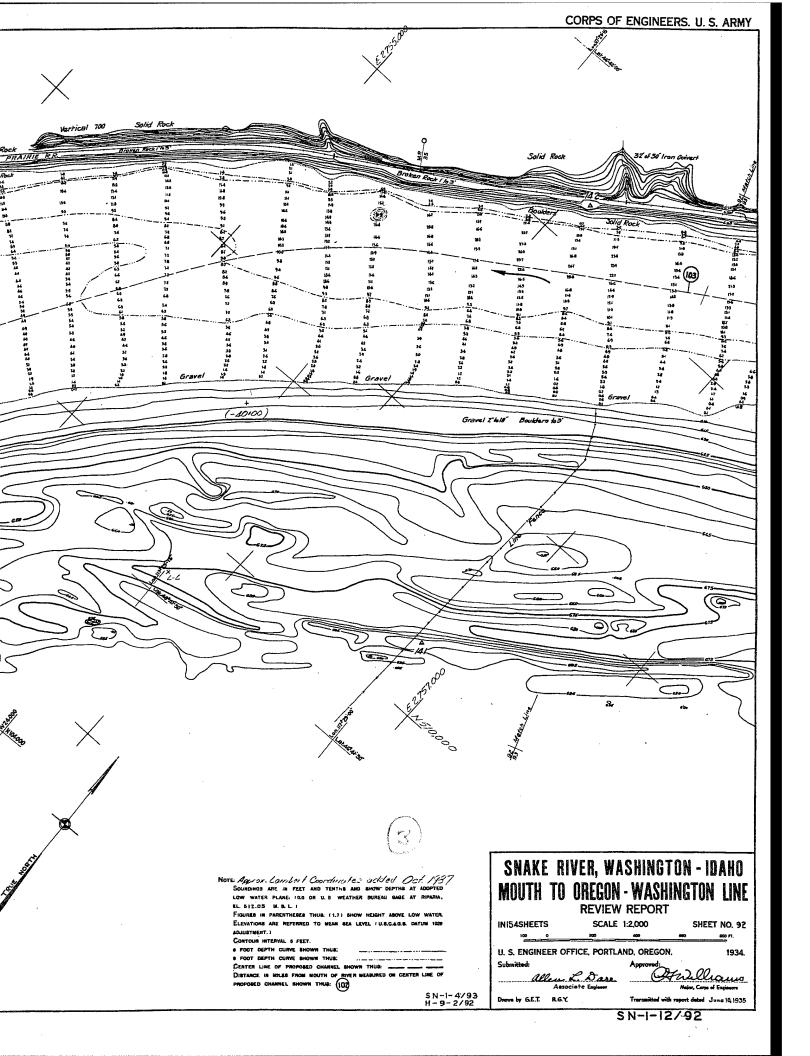


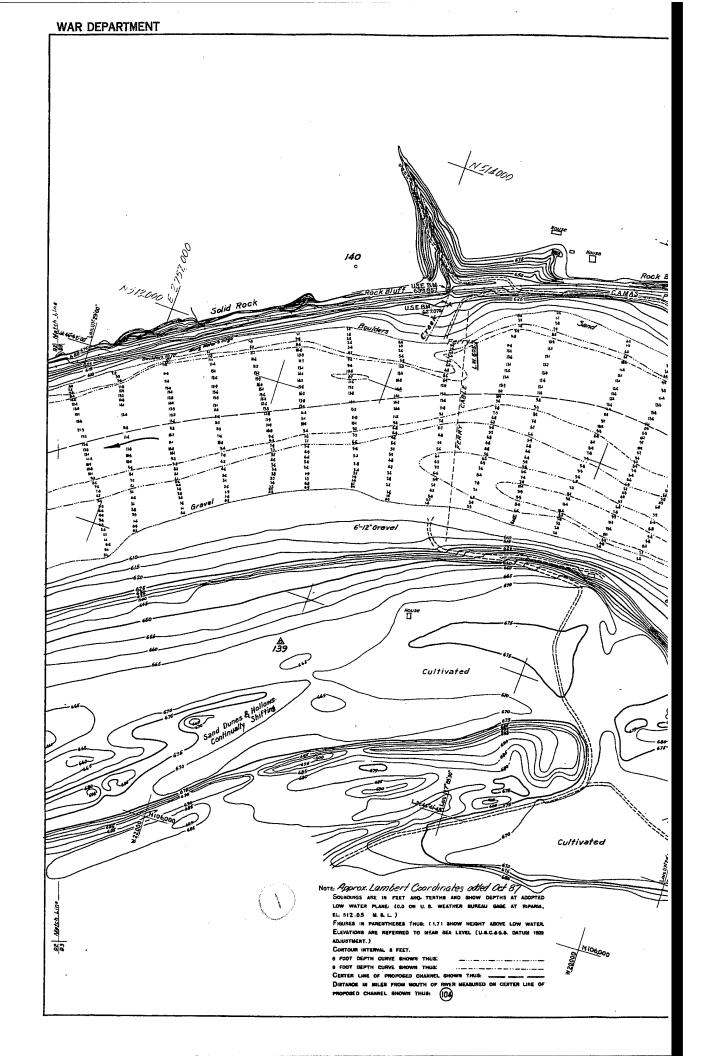


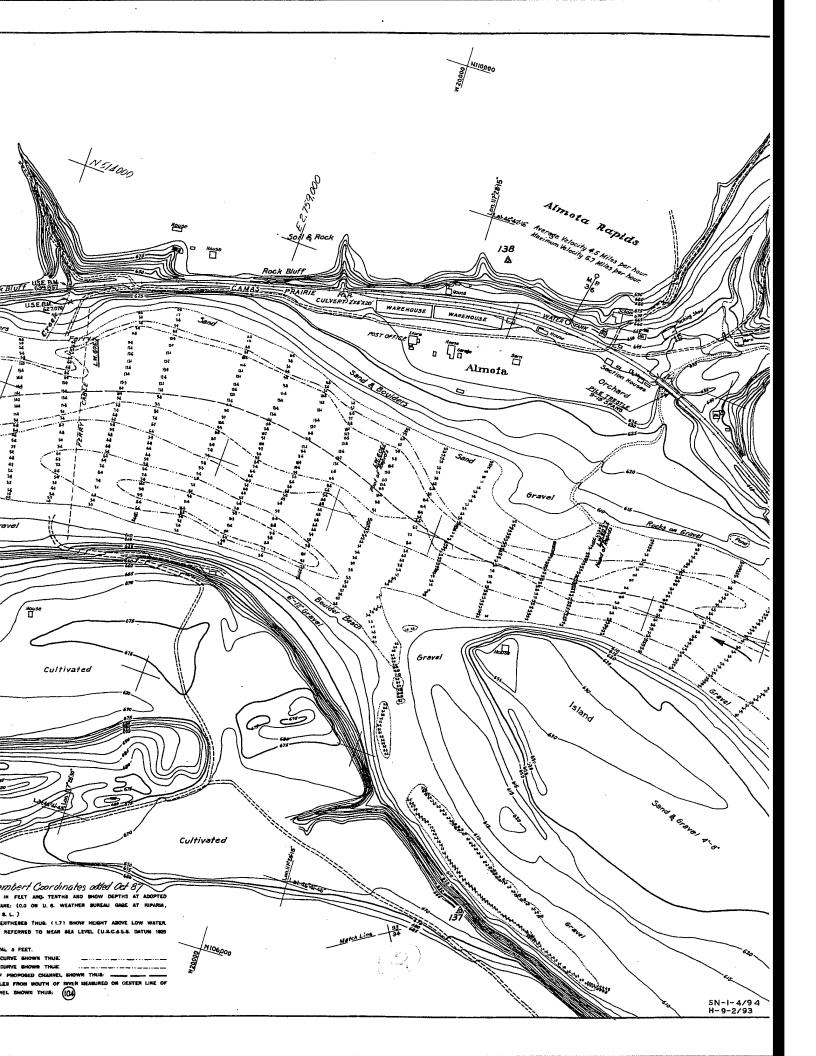




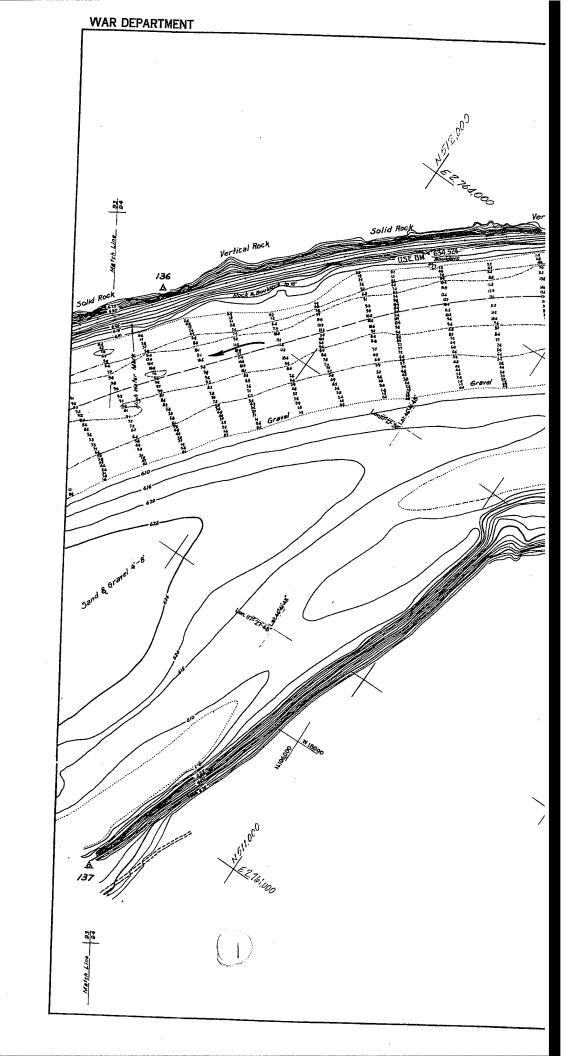


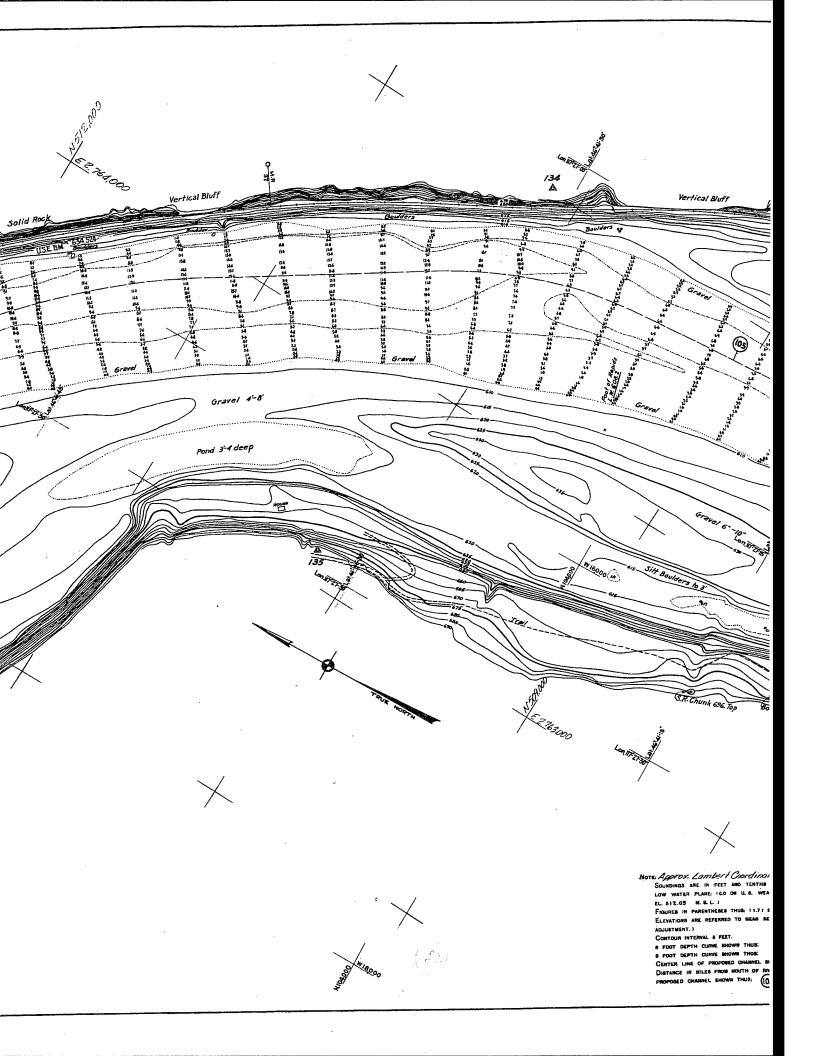


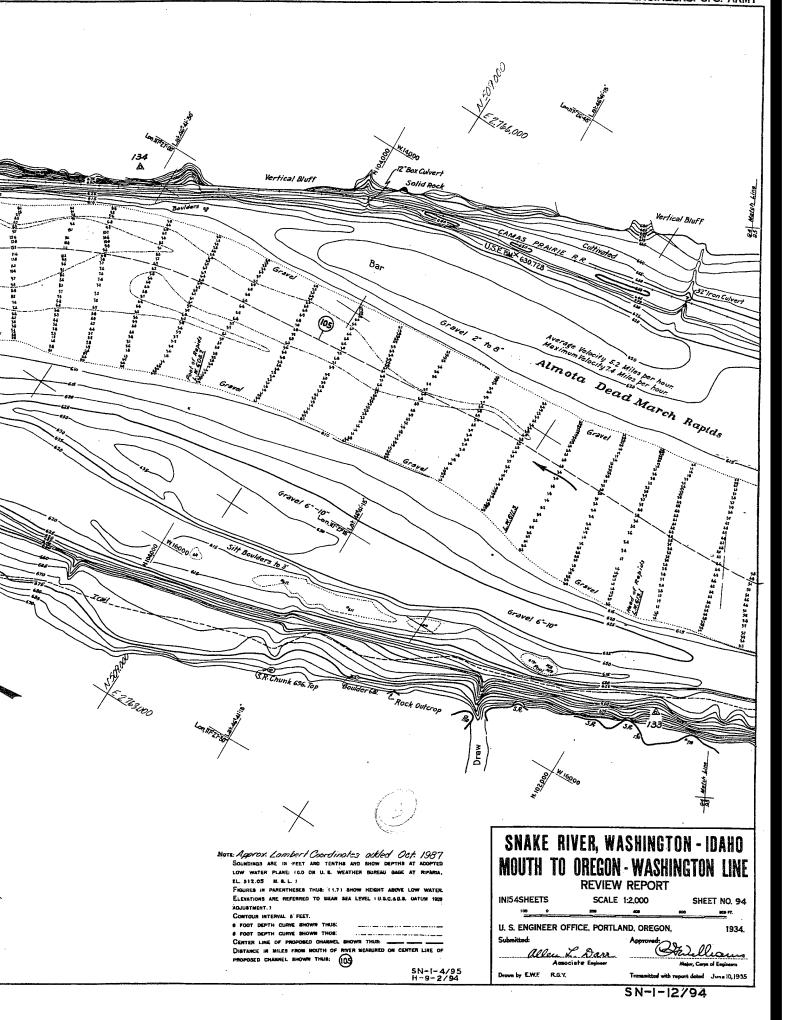


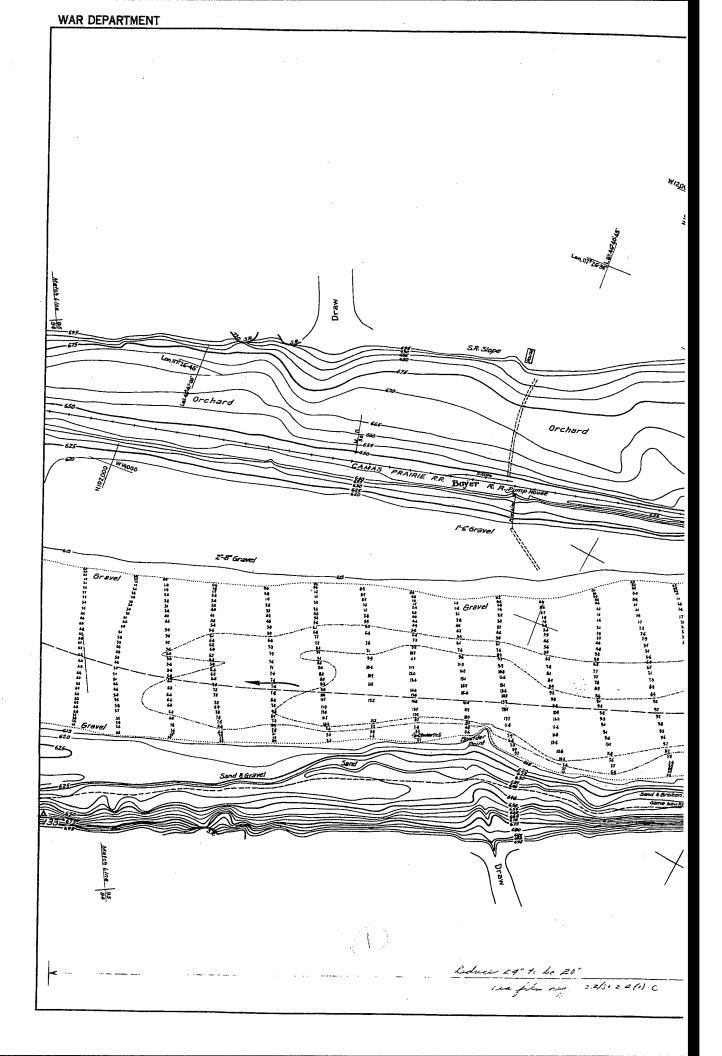


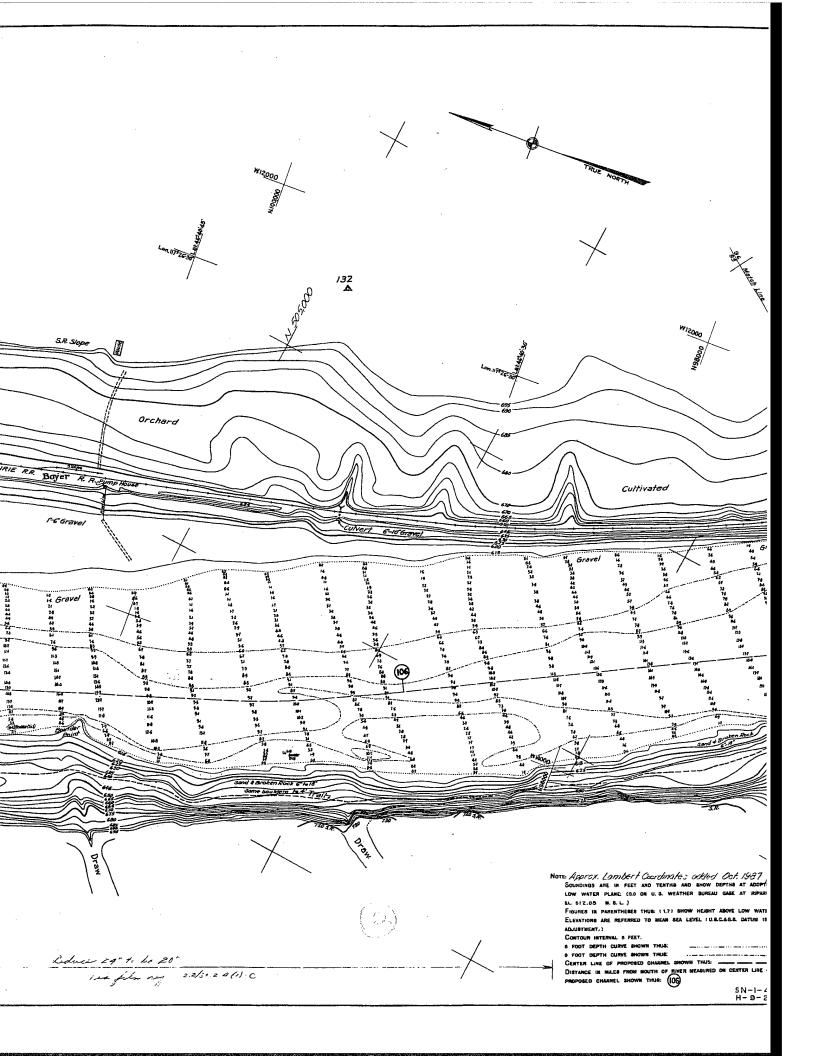


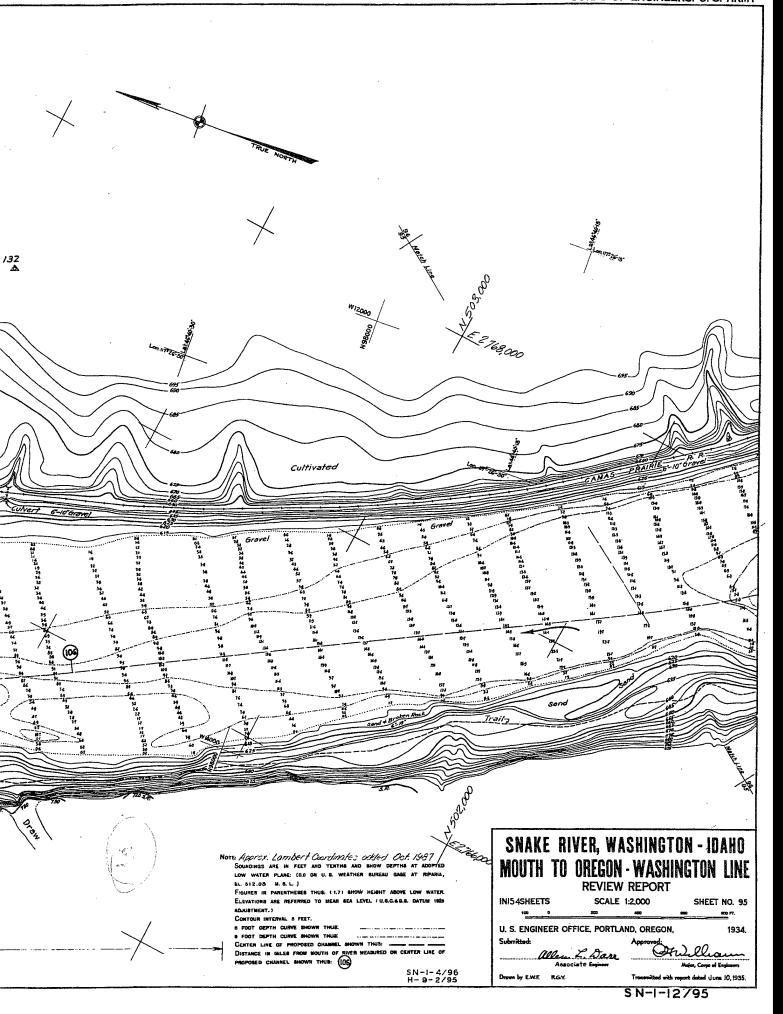


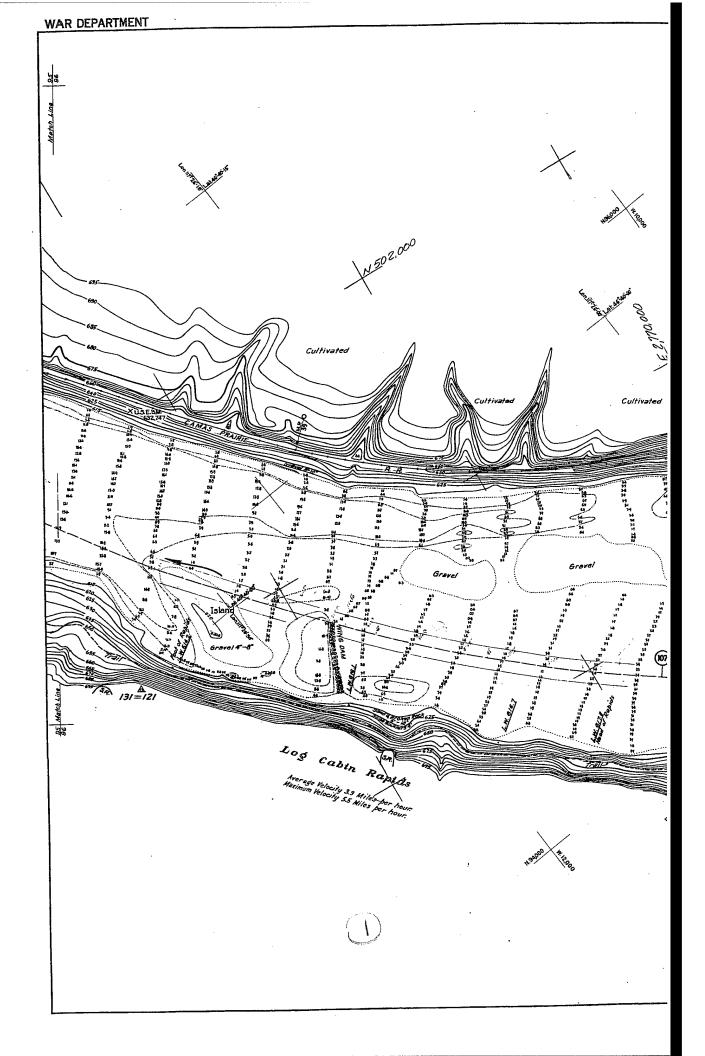


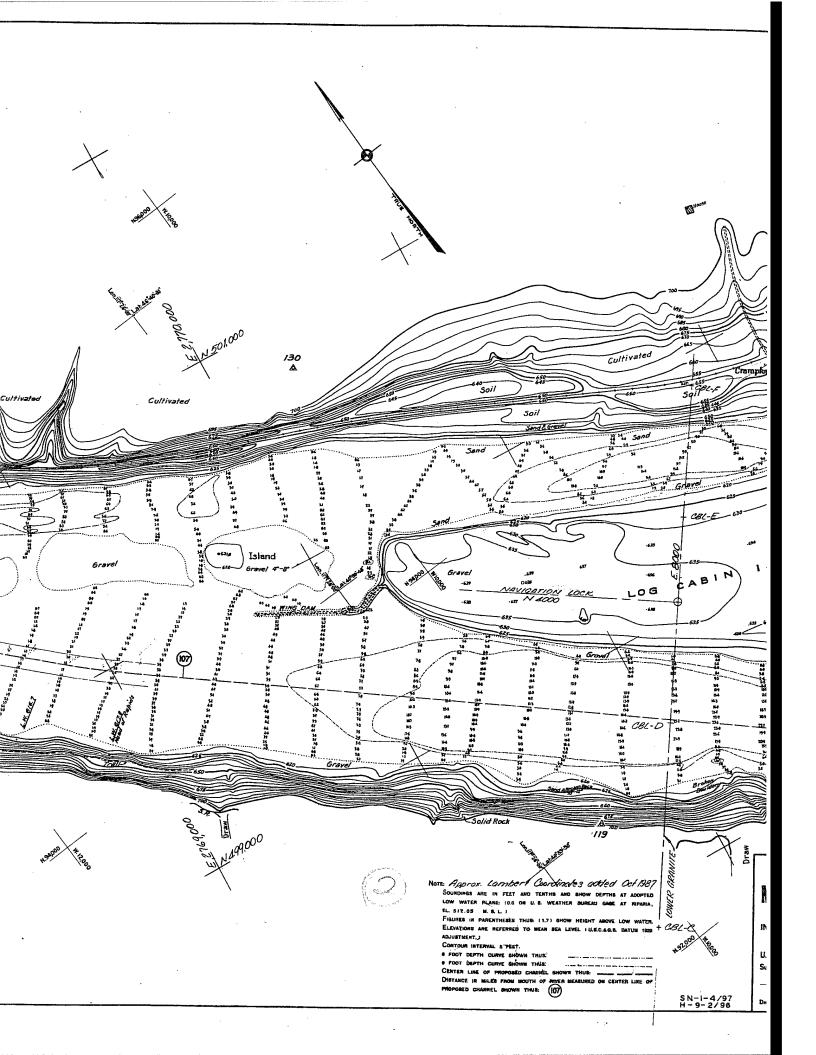


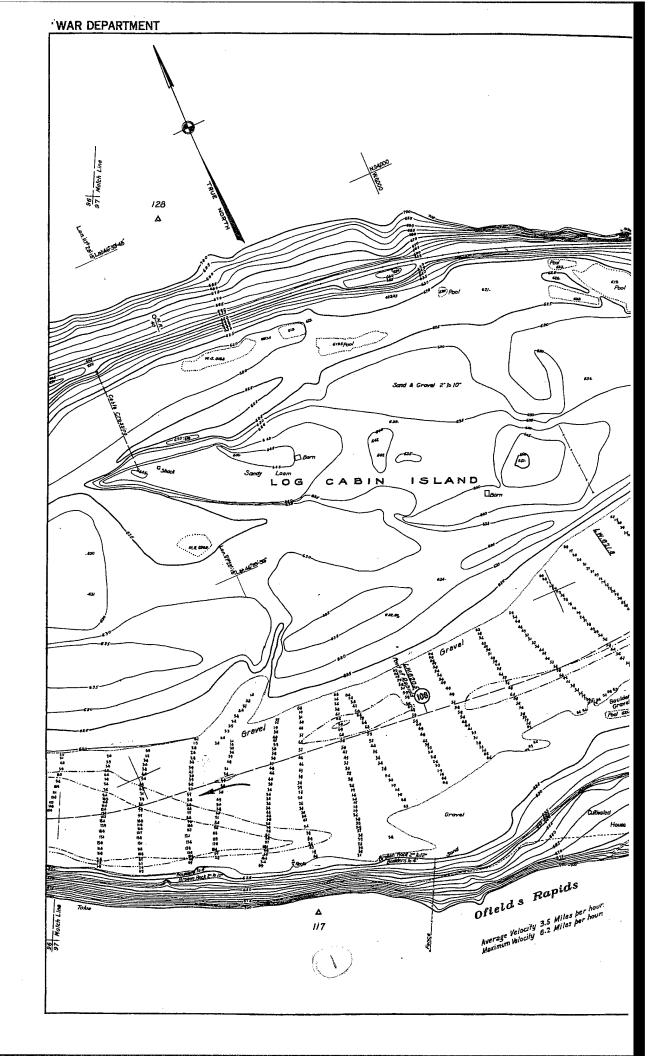


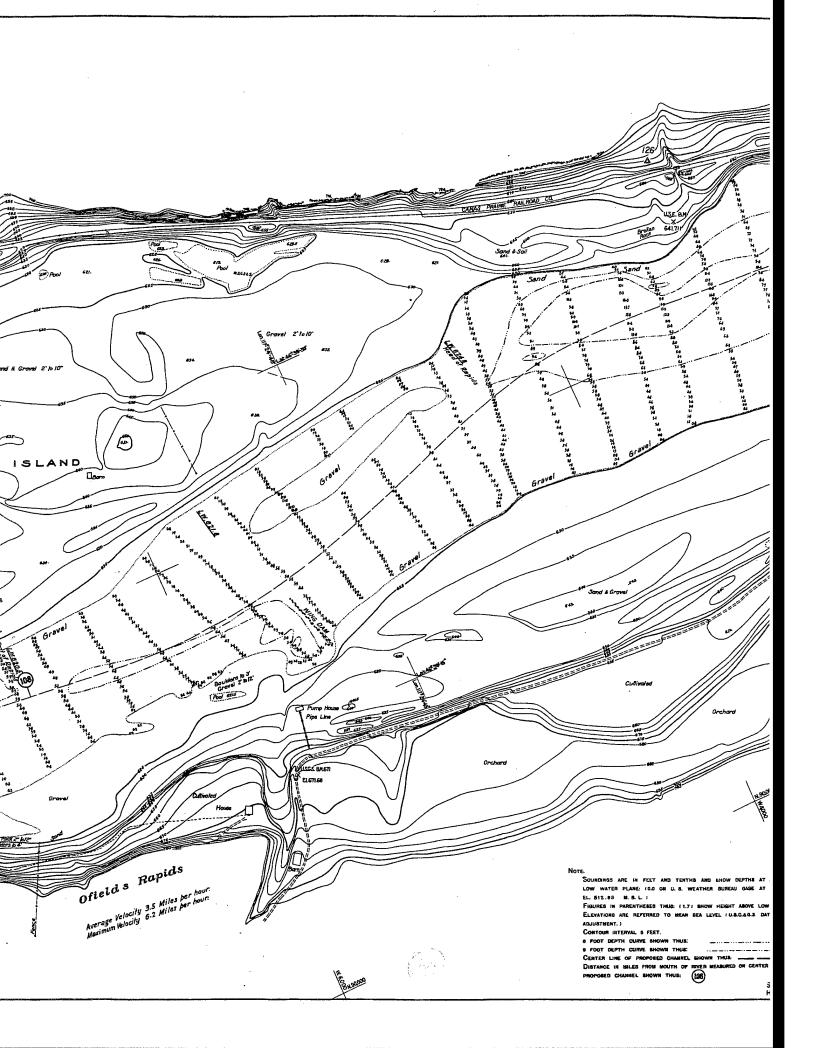


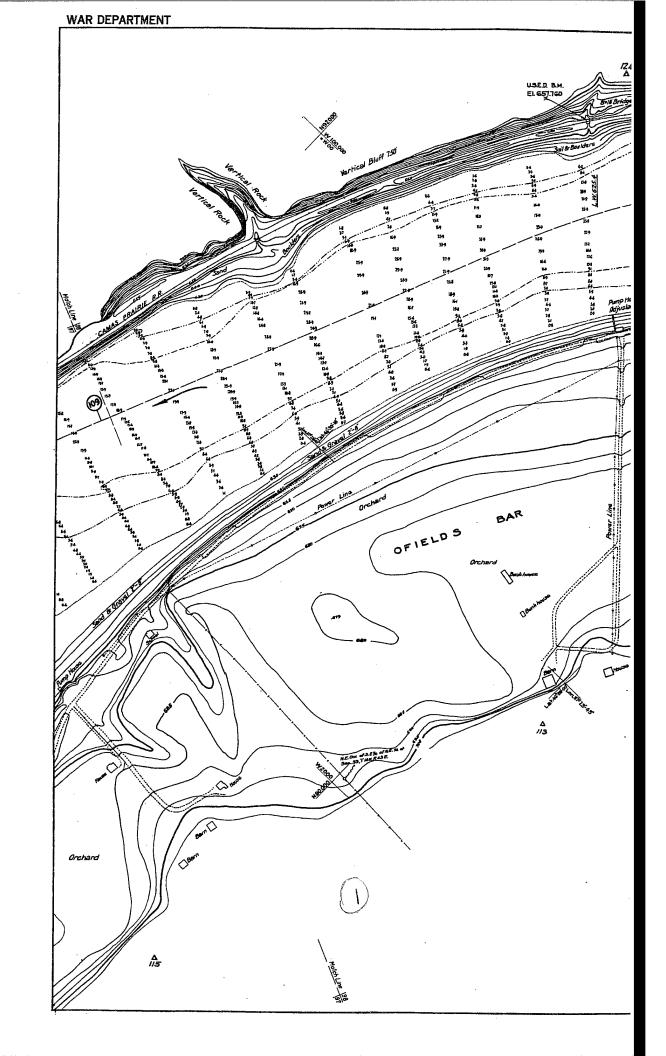


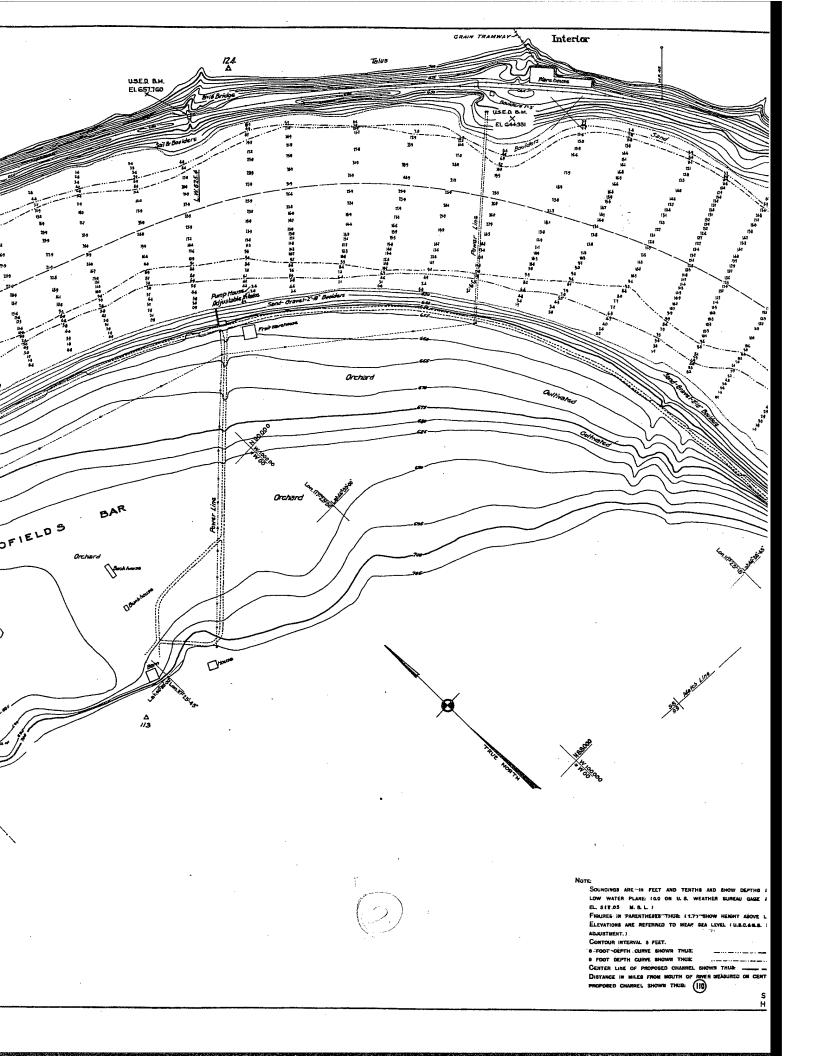


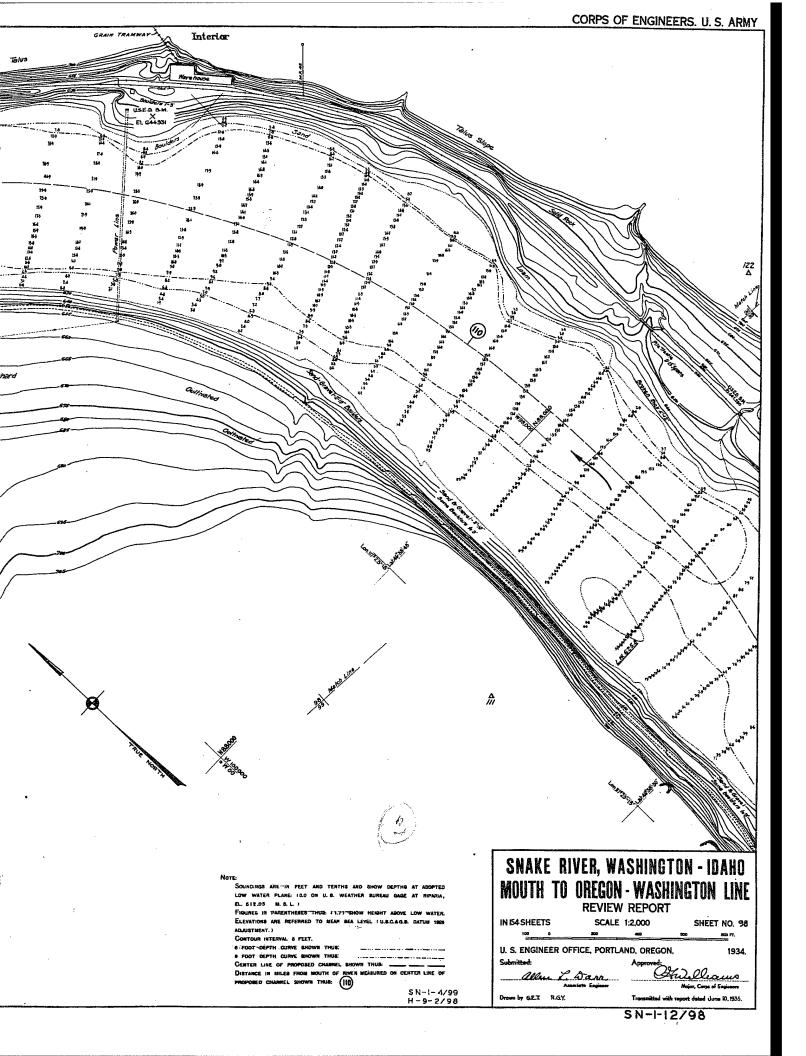


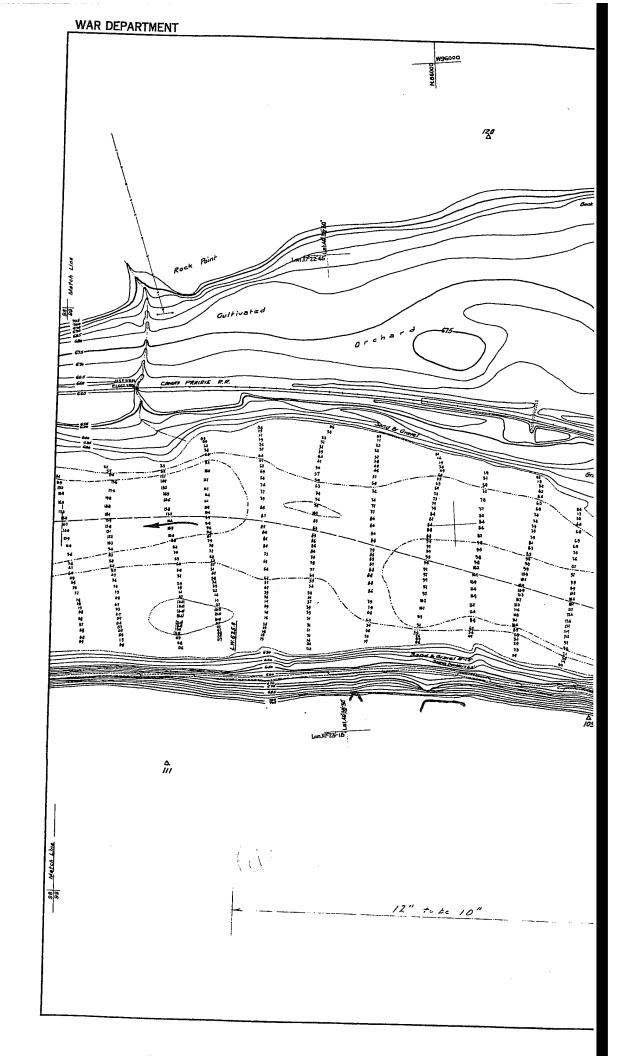


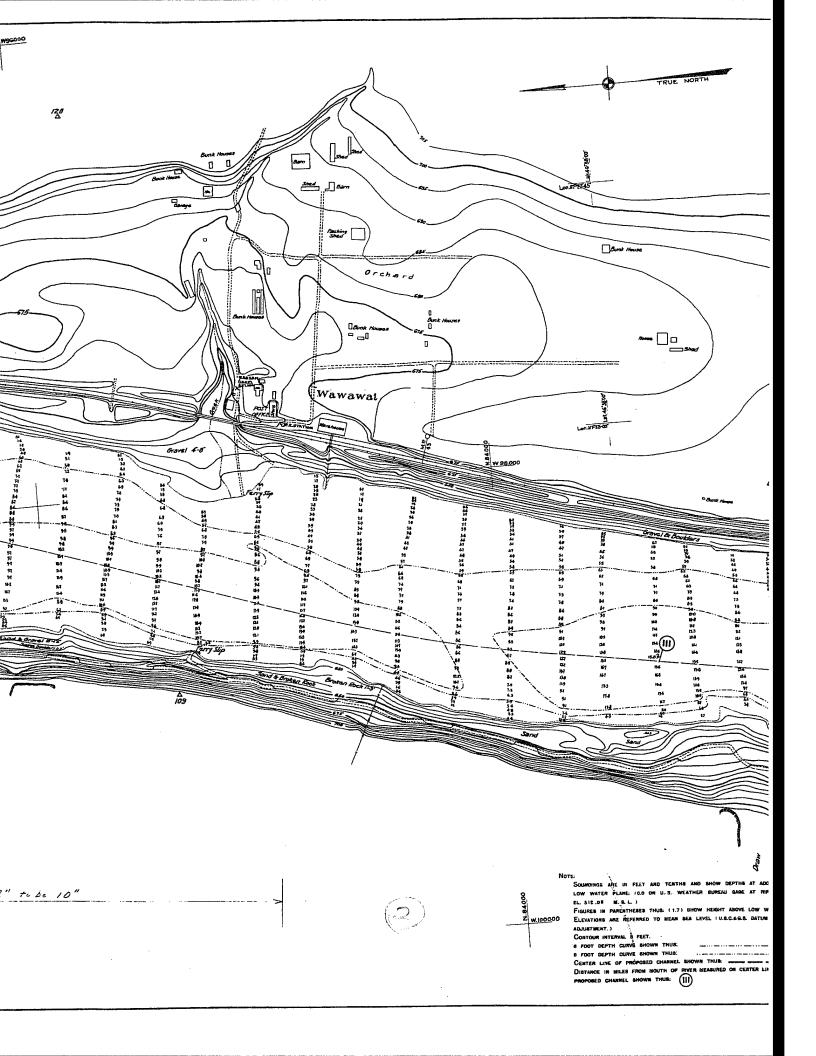


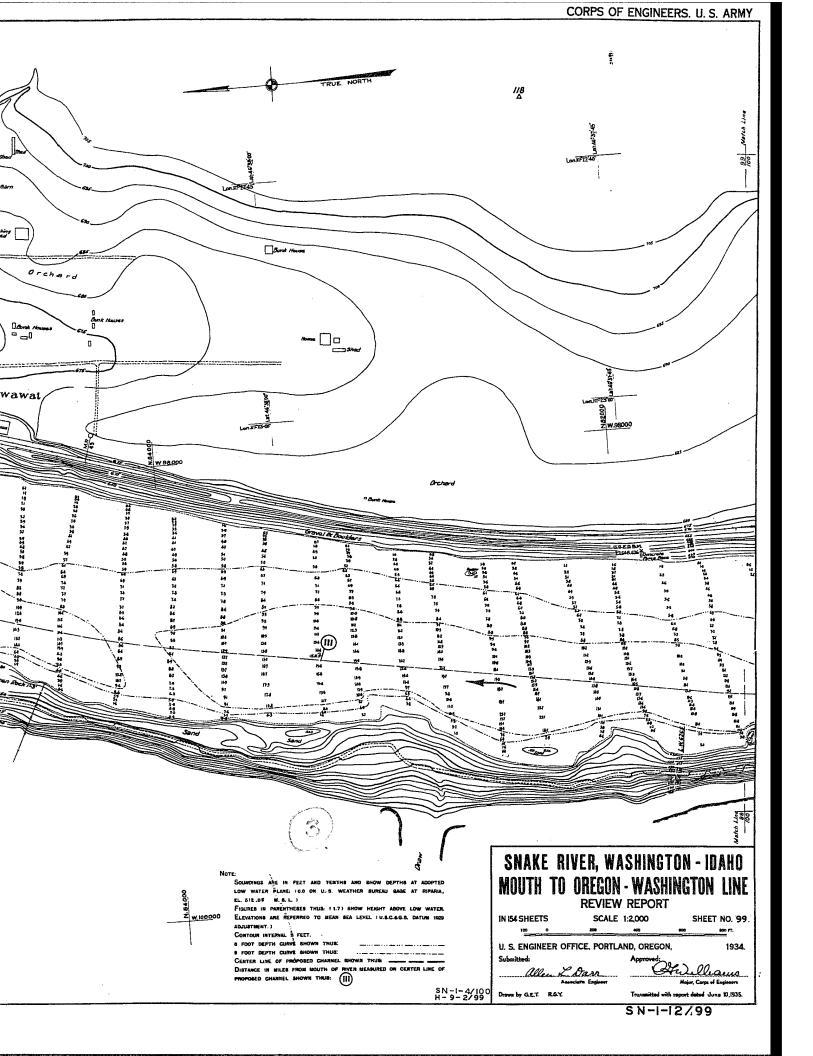


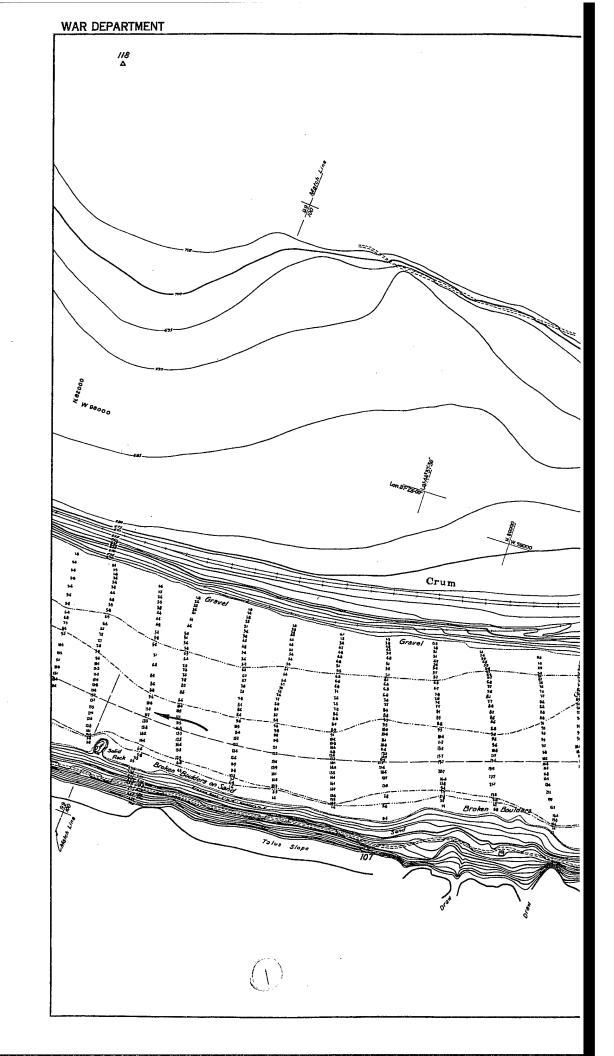


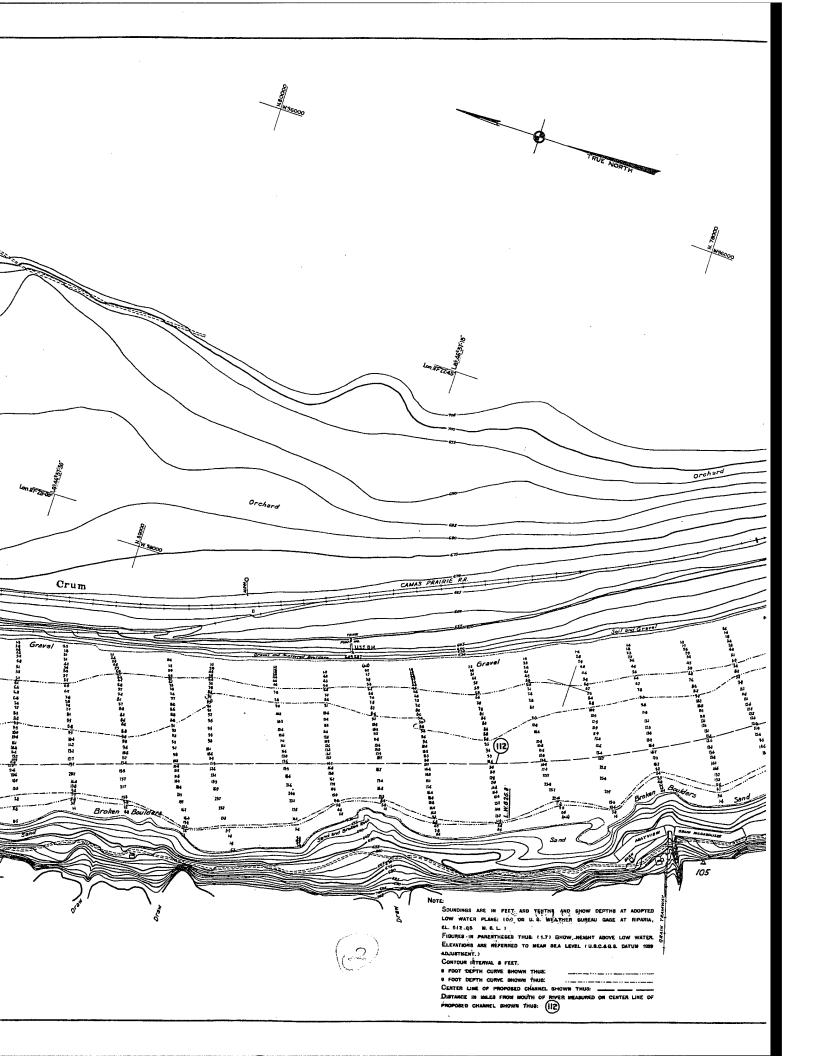


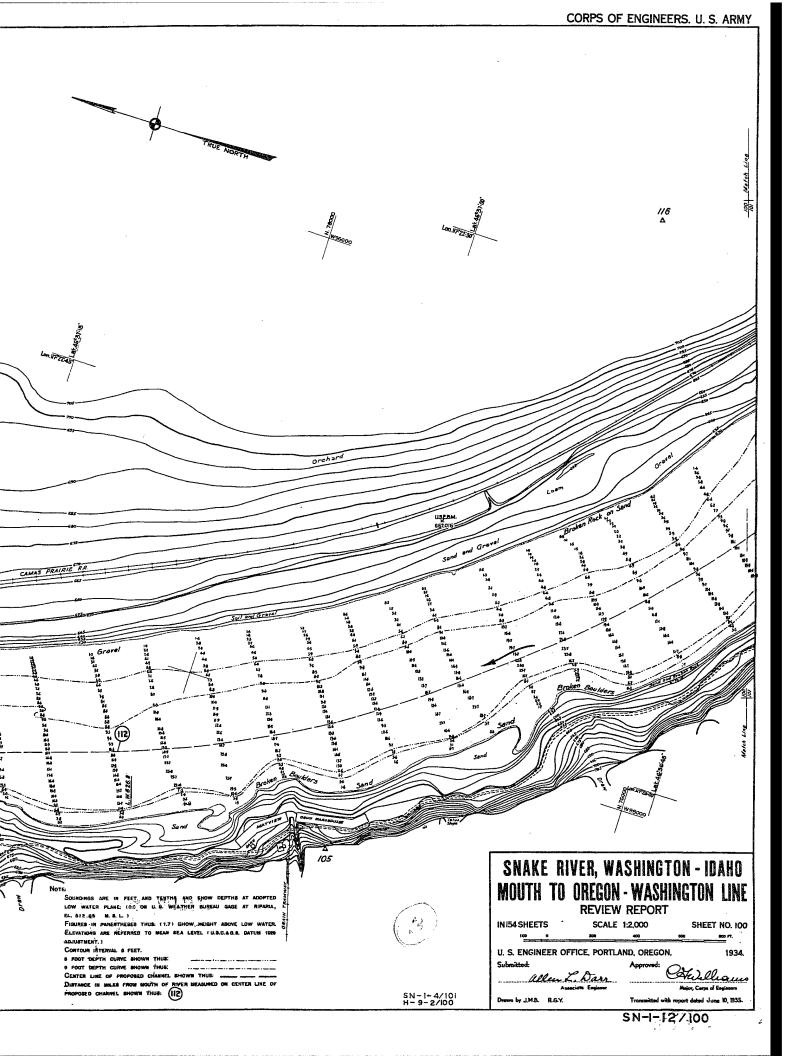


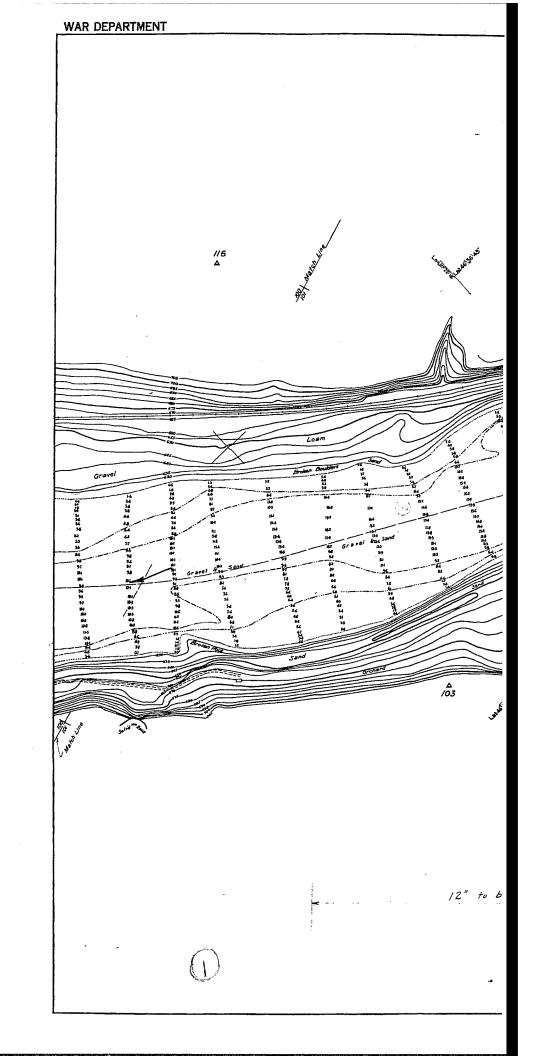


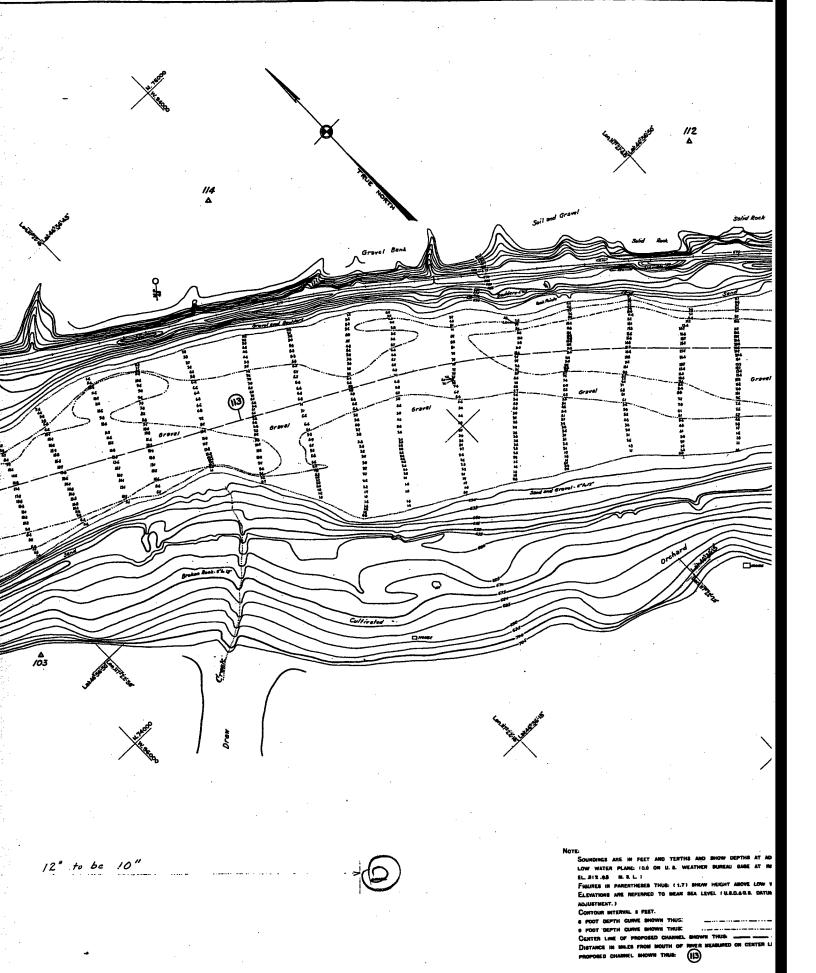




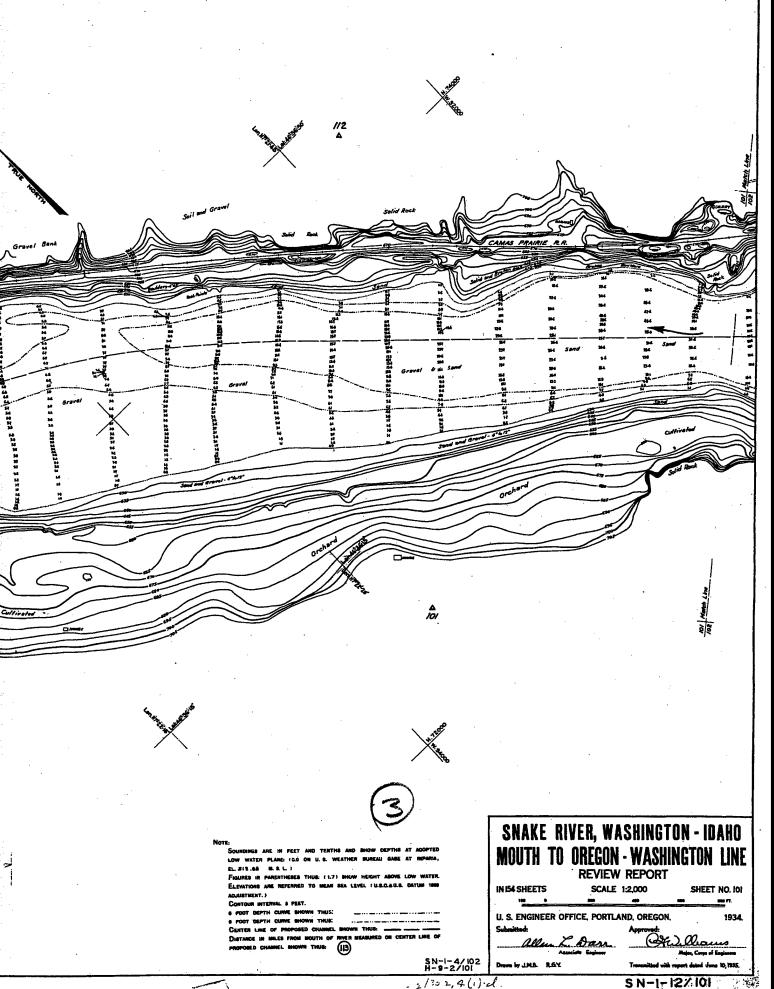


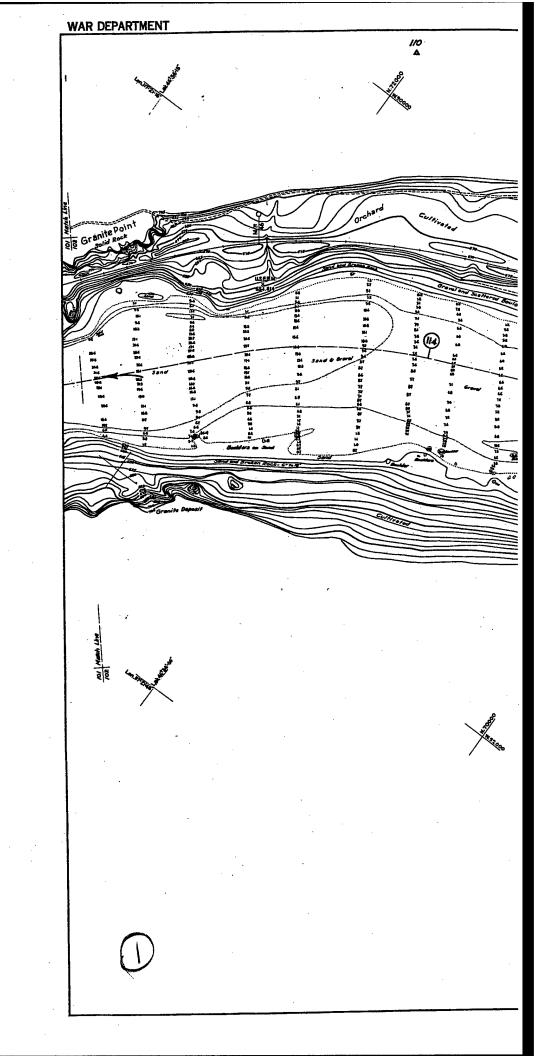


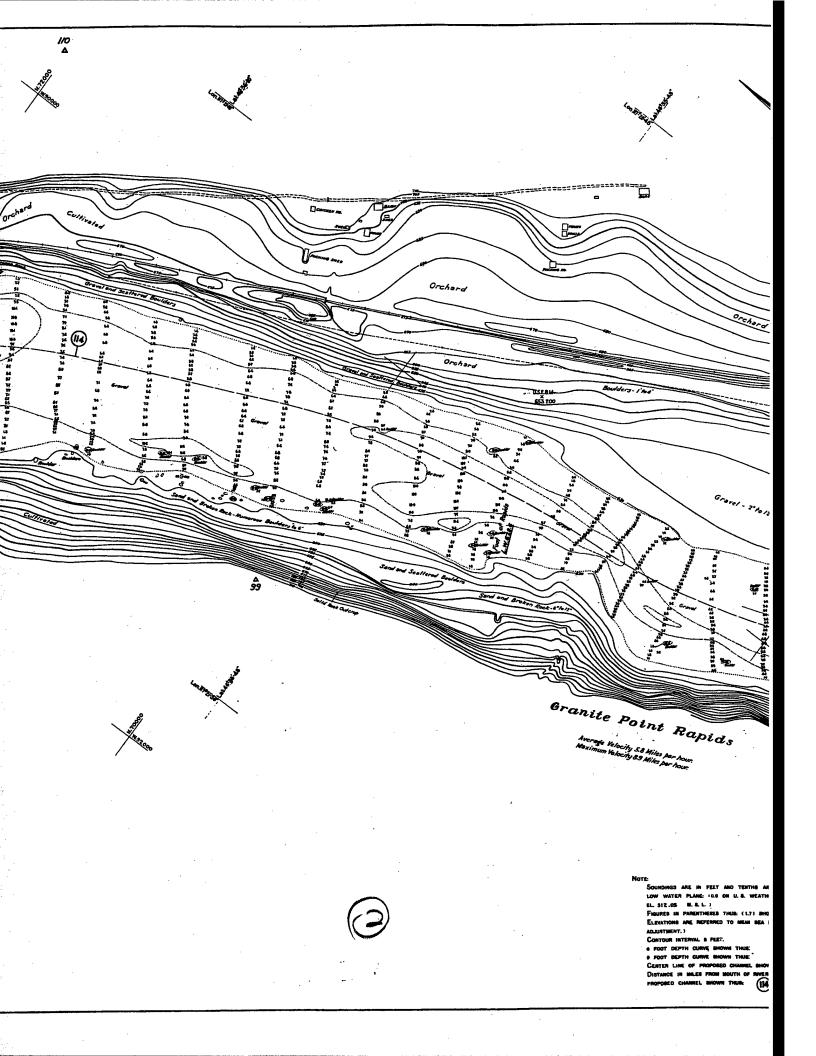


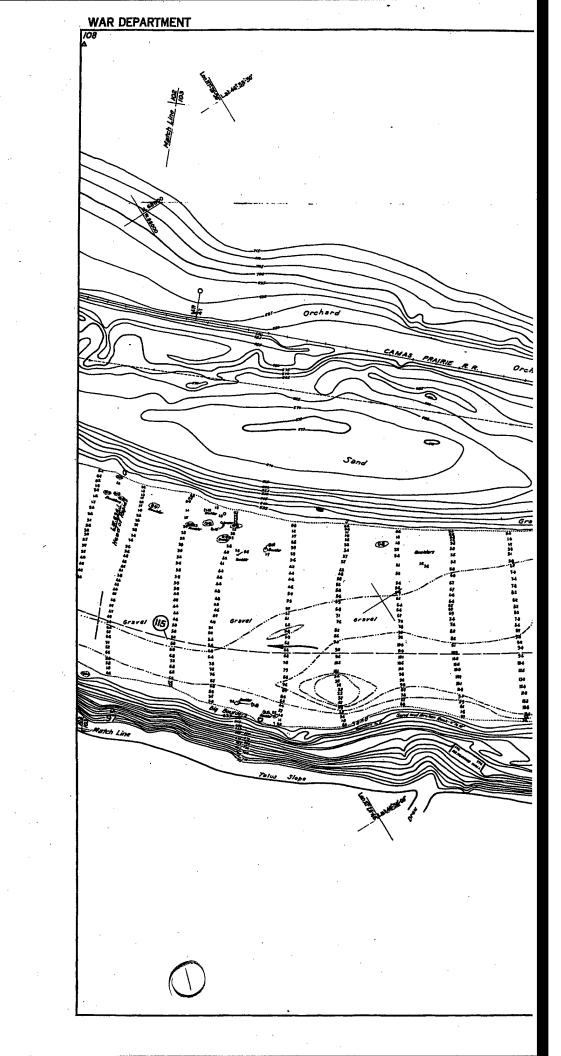


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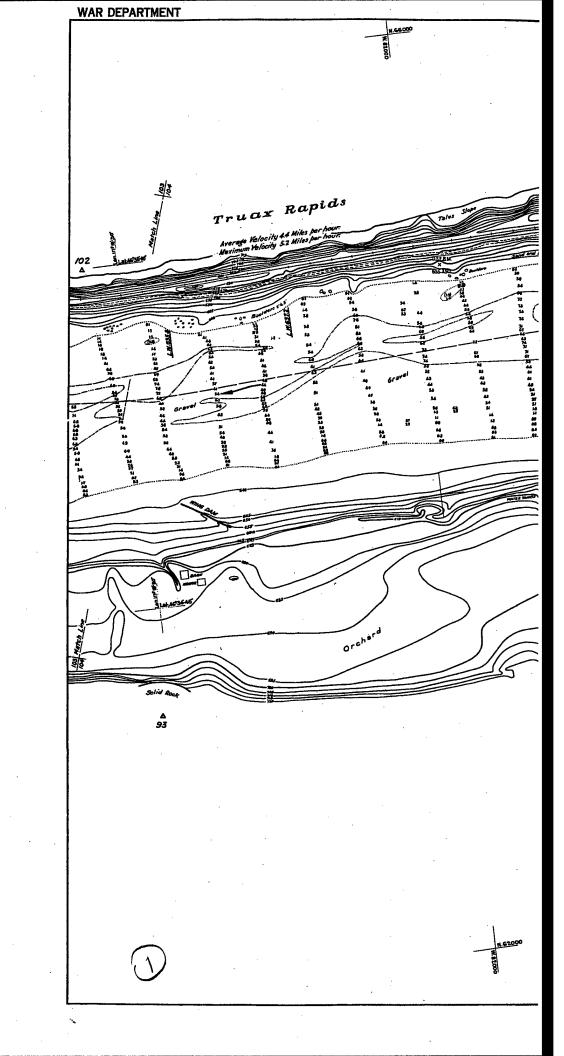


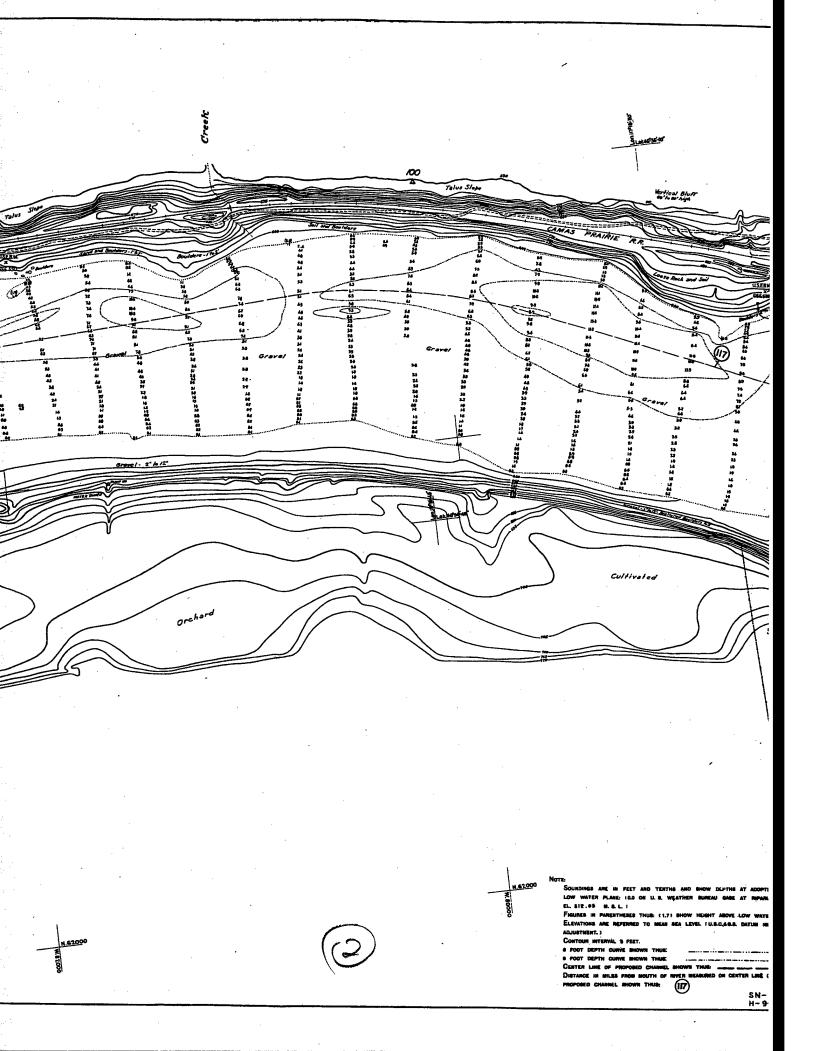


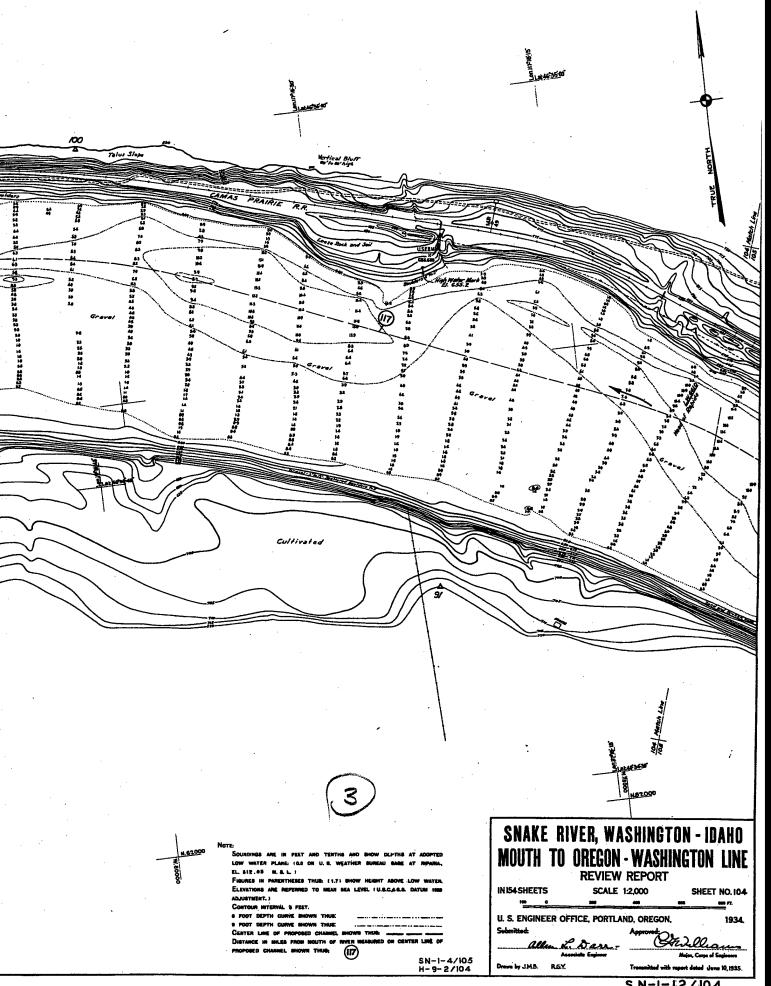


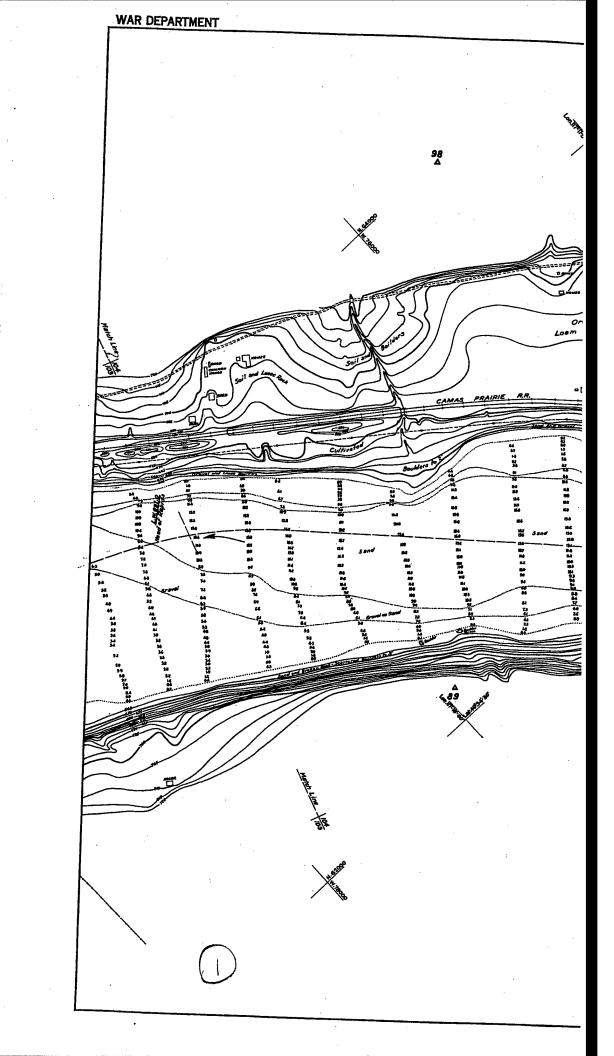


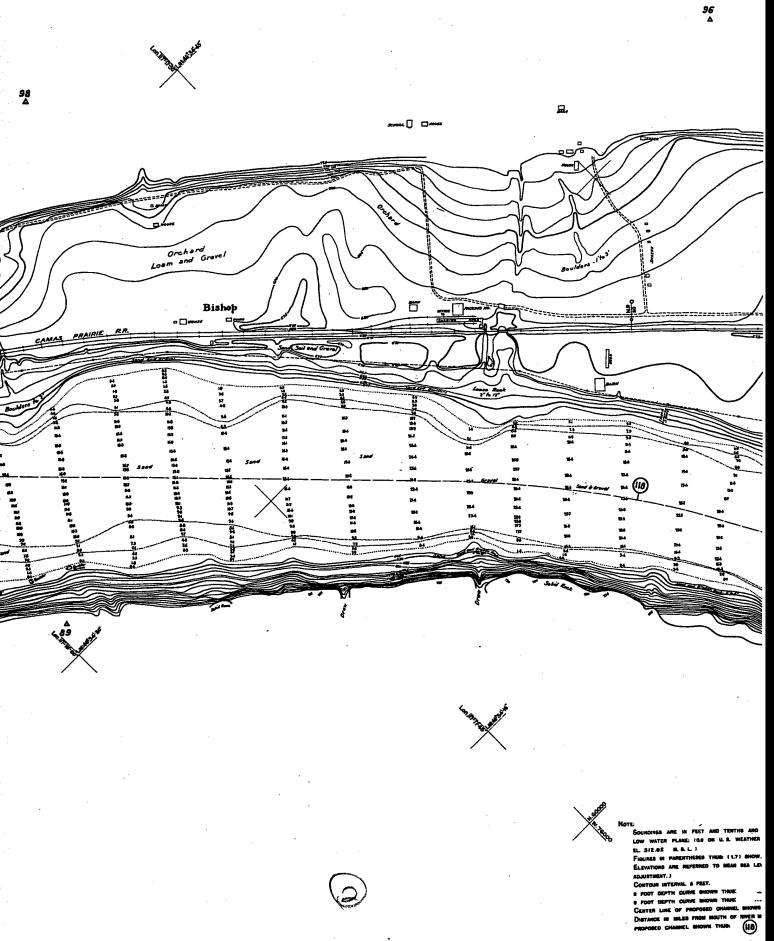


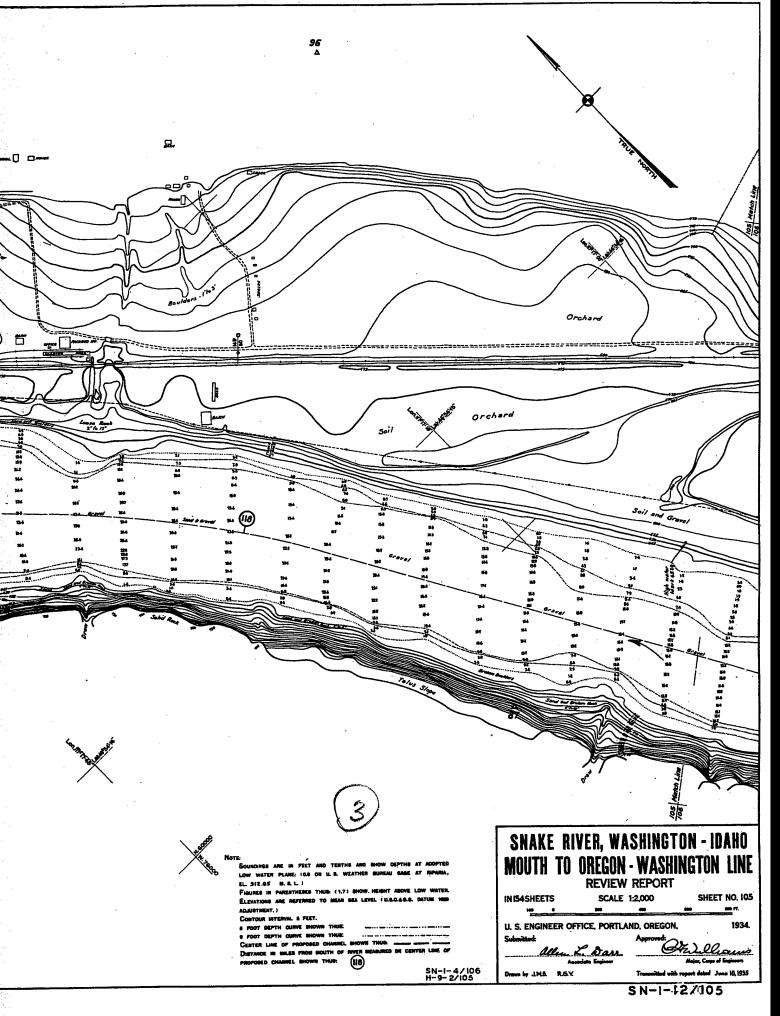


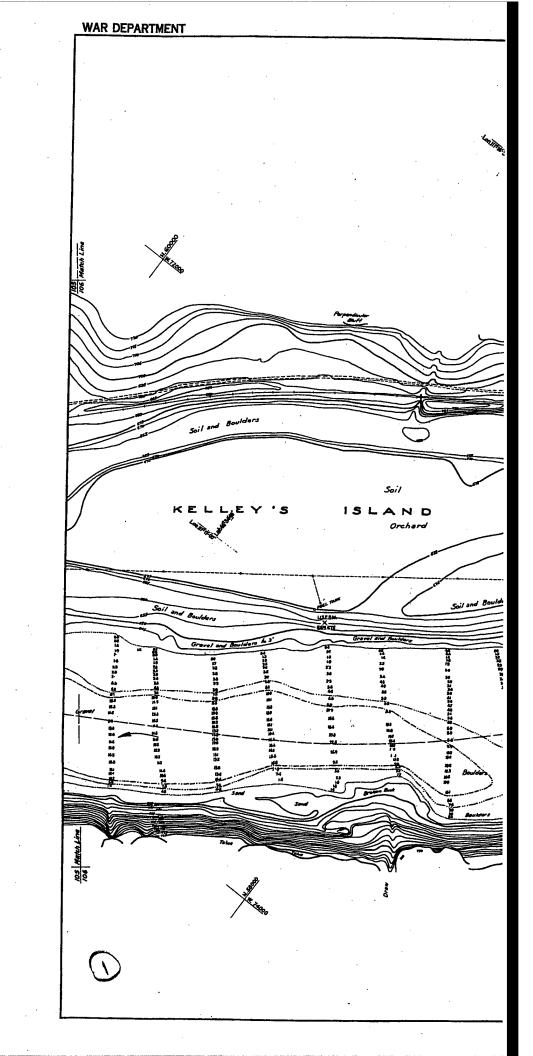


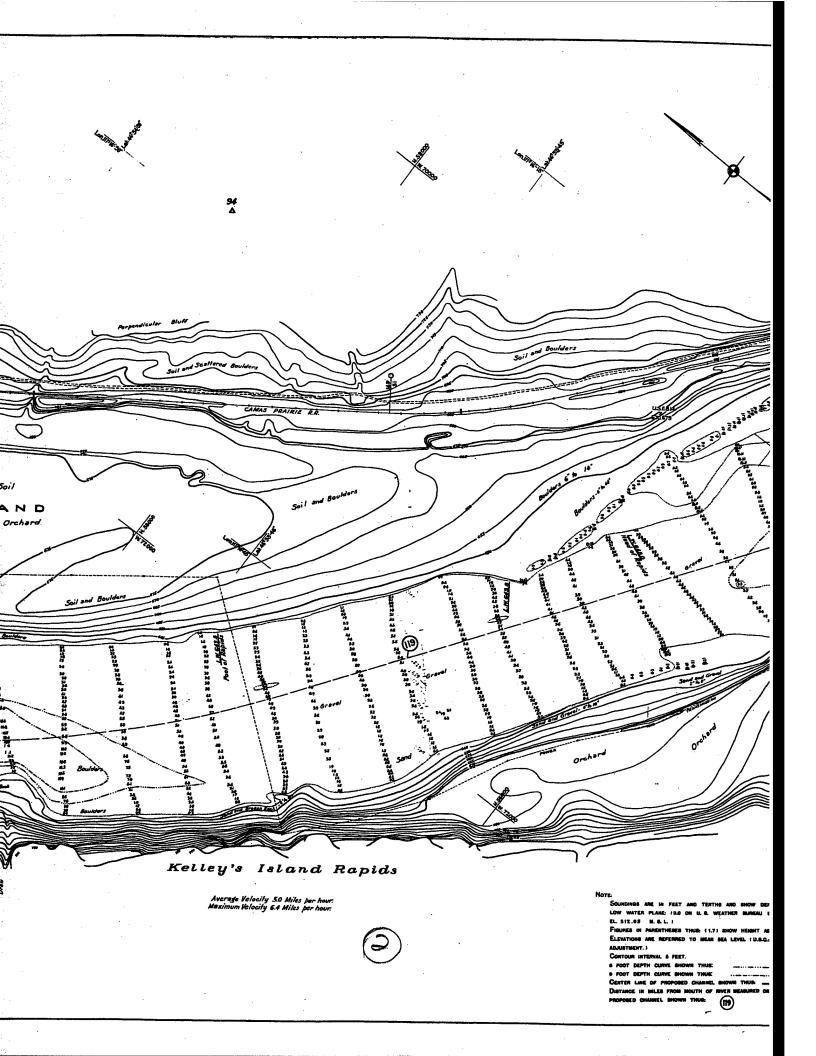




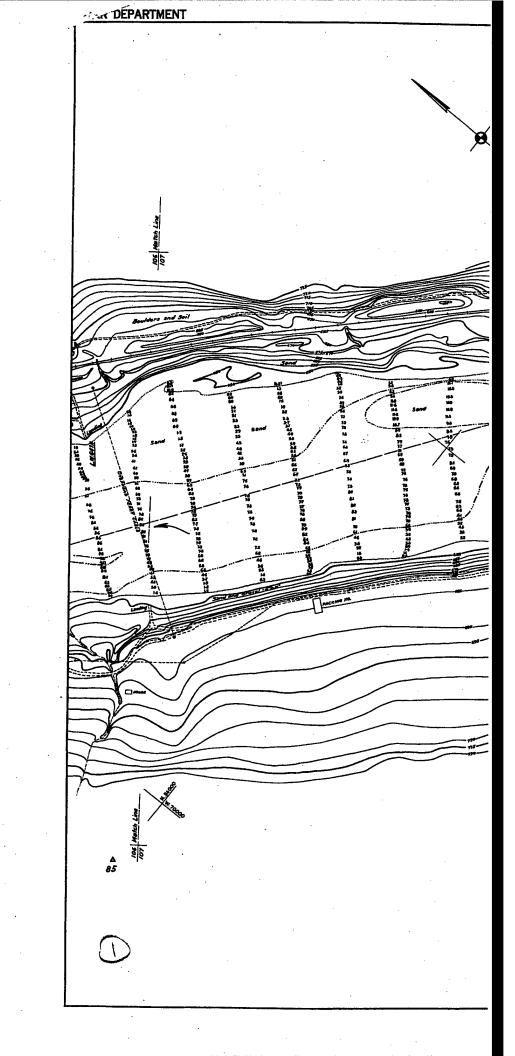


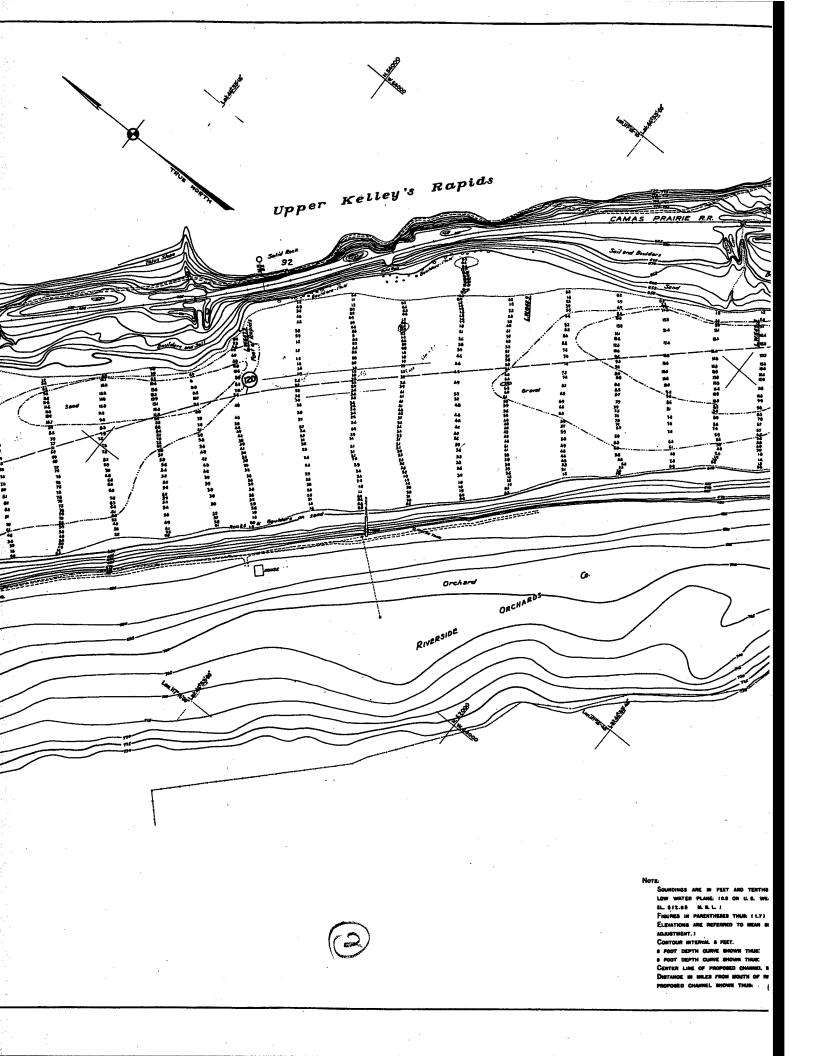


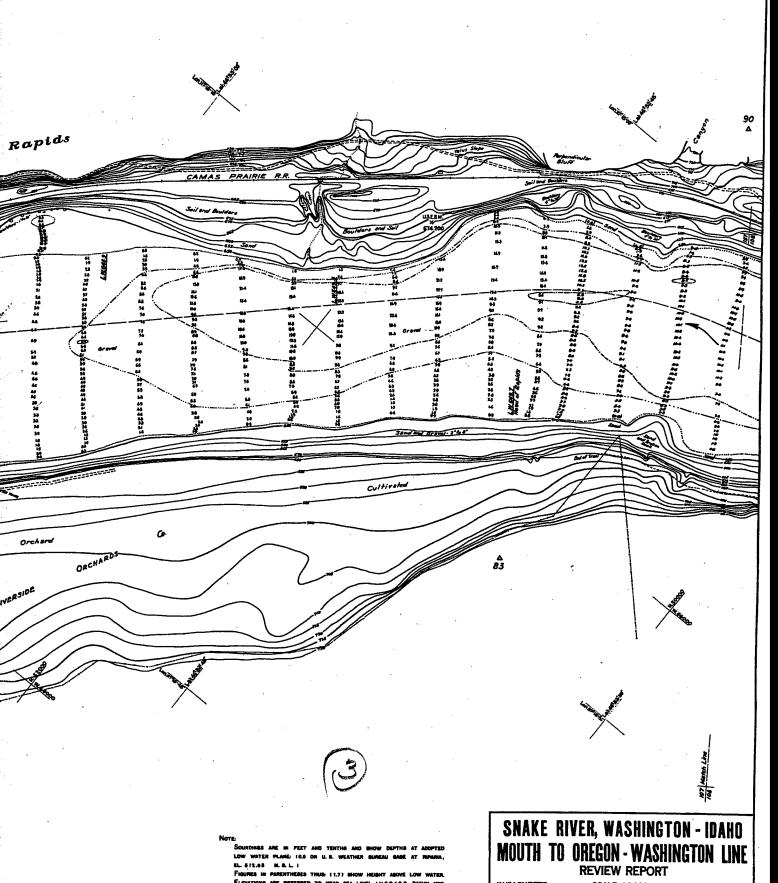












NOTE: SOUNDINGS ARE IN PEET AND TENTHS AND SHOW DEPTHS AT ADOPTED LOW WATER PLANE: 10.0 ON U. B. WEATHER SUMEAU GASE AT RIPARIA, EL. 512.05 IL. 6. L. 1 FRUIRES IN PARENTHERES THUS: (1.7) SHOW HEIGHT ABOVE LOW WATER. ELEVATIONS ARE REPERRED TO MEAN SEA LEVEL / U.B.C.A.G.G. DATUM 1989 ADJUSTMENT.) CONTOUR INTERVAL IS PEET. 8 POOT DEPTH CURVE SHOWN THUS: 8 POOT DEPTH CURVE SHOWN THUS: CENTER LINE OF PROPOSED COMMINEL SHOWN THUS: CENTER LINE OF PROPOSED COMMINEL SHOWN THUS:

SN-1-4/108 H-9-2/107

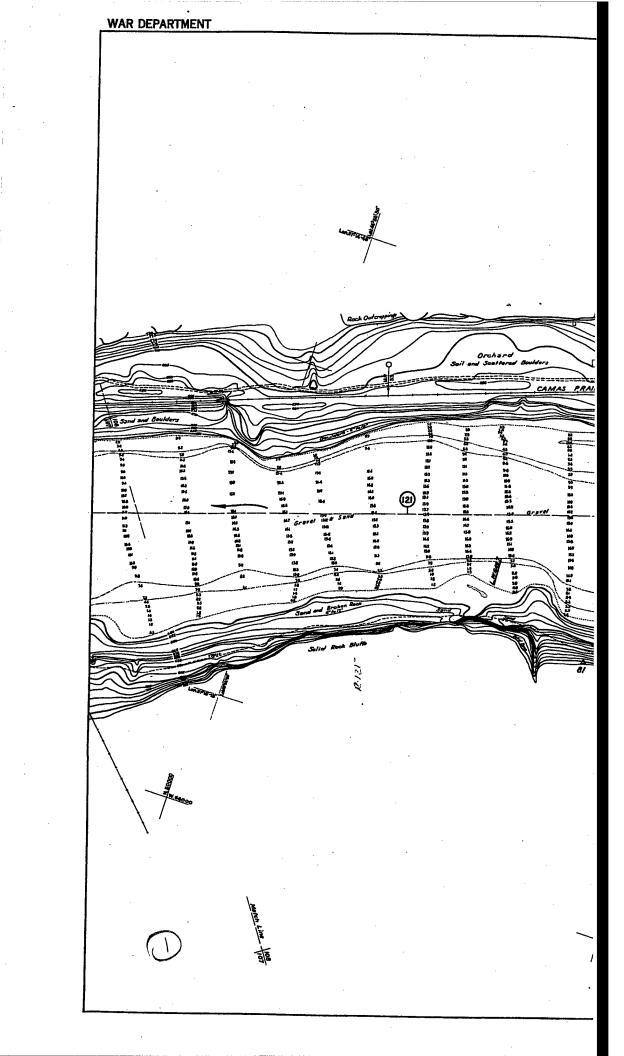
IN 154 SHEETS SCALE 1:2,000

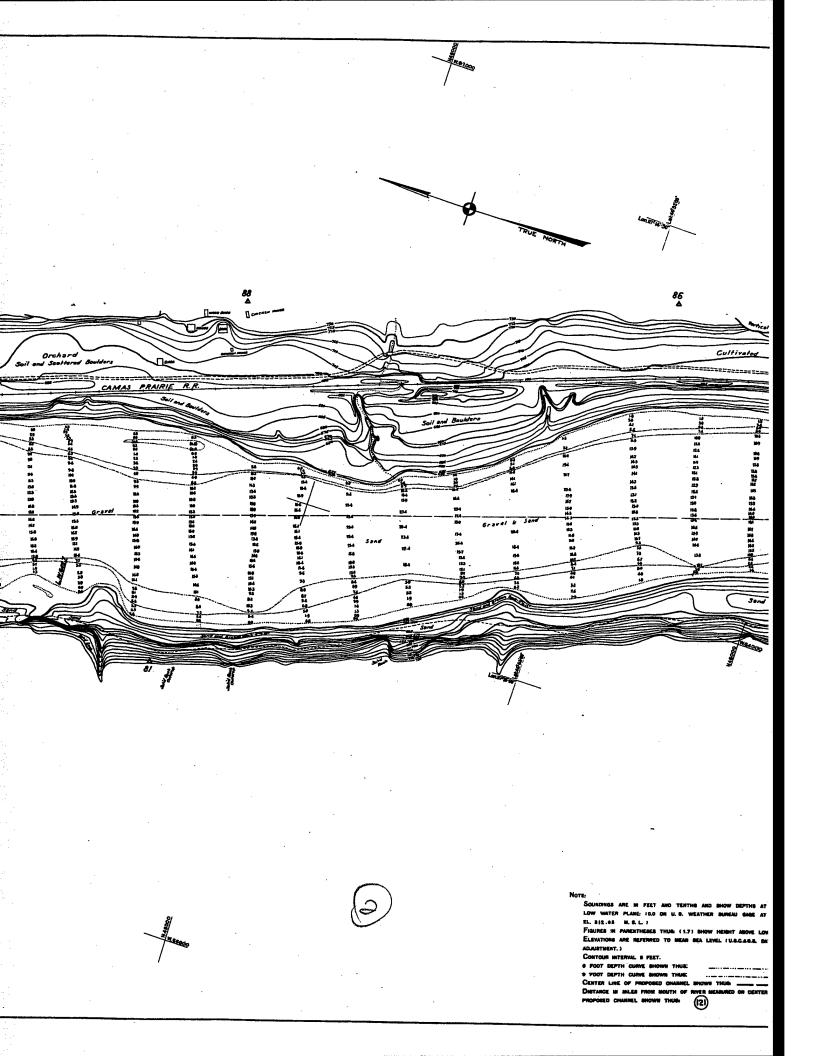
50 m 7.

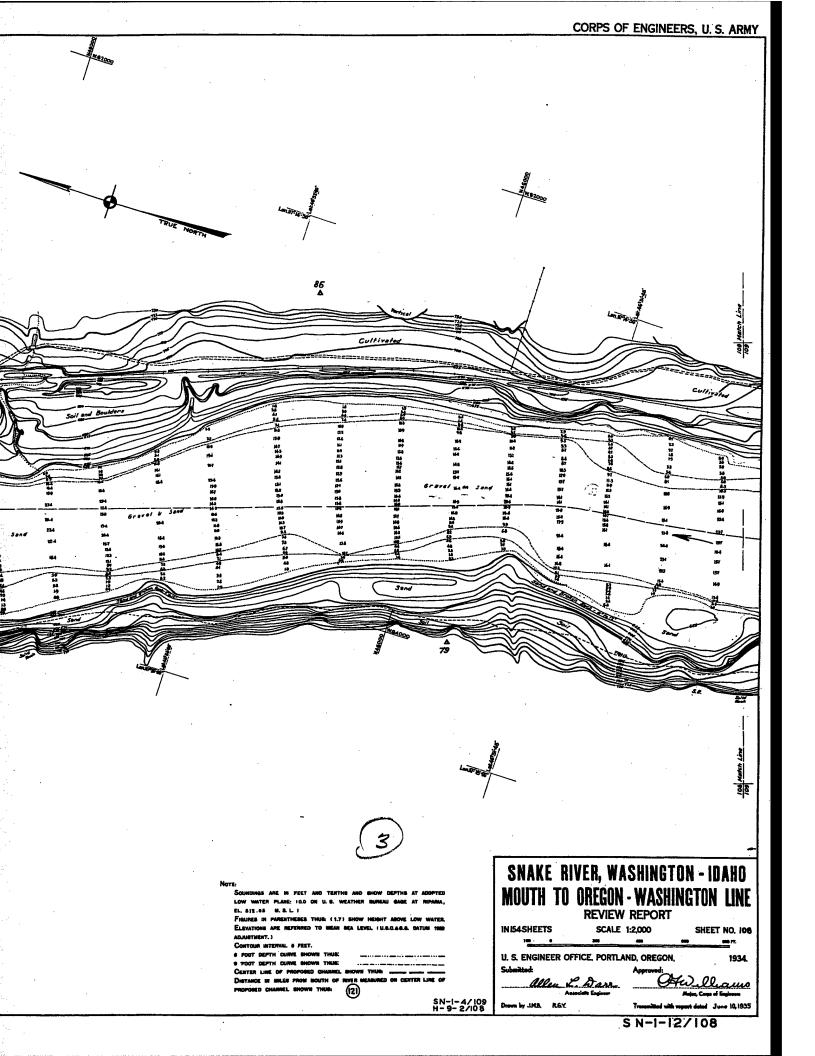
U. S. ENGINEER OFFICE, PORTLAND, OREGON,
Submitted:
Account

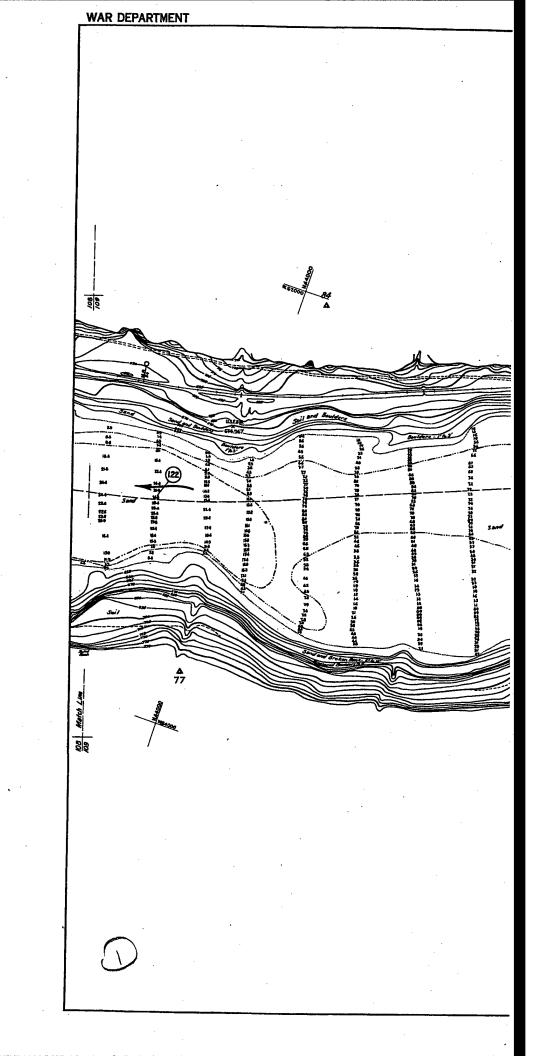
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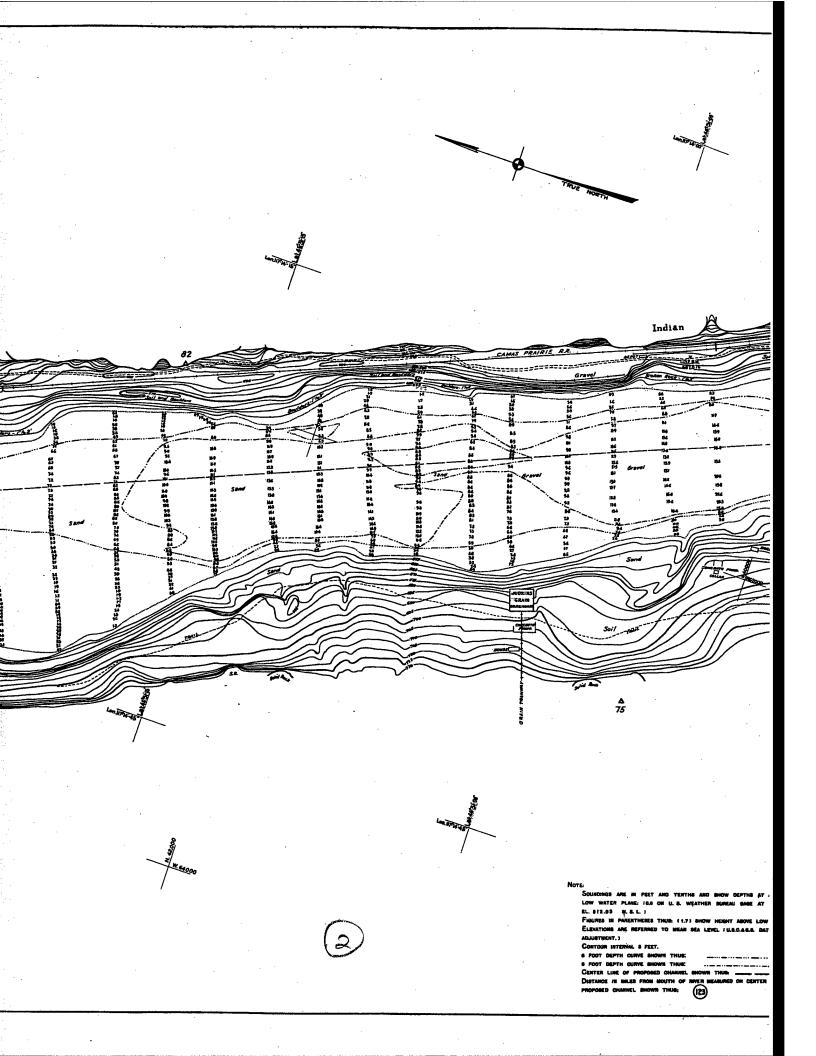
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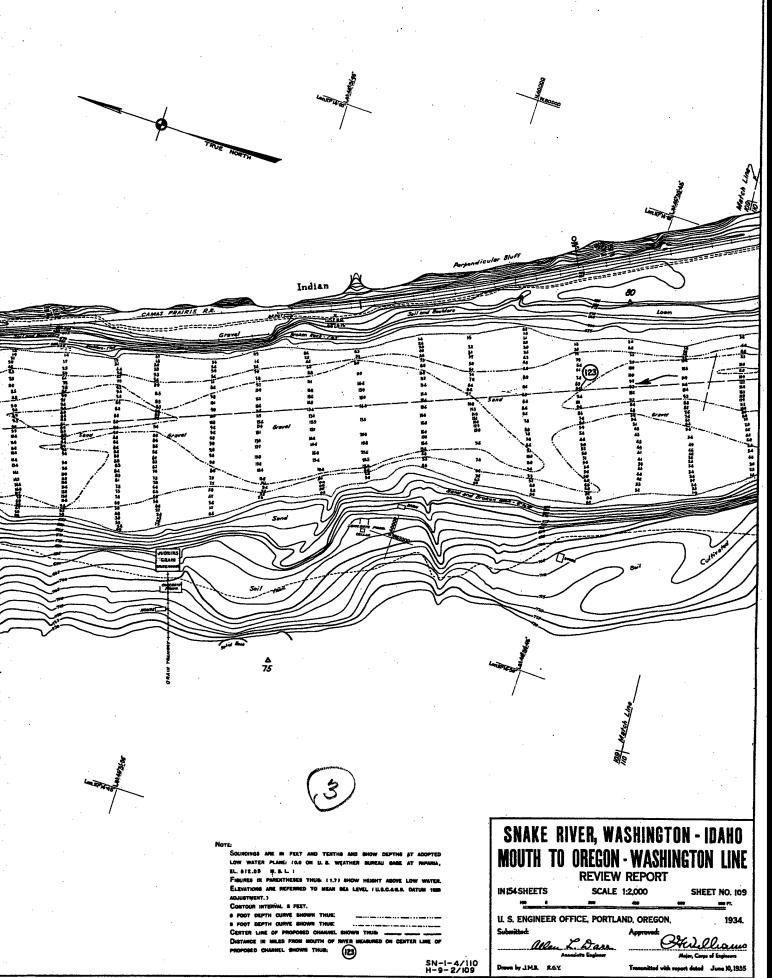




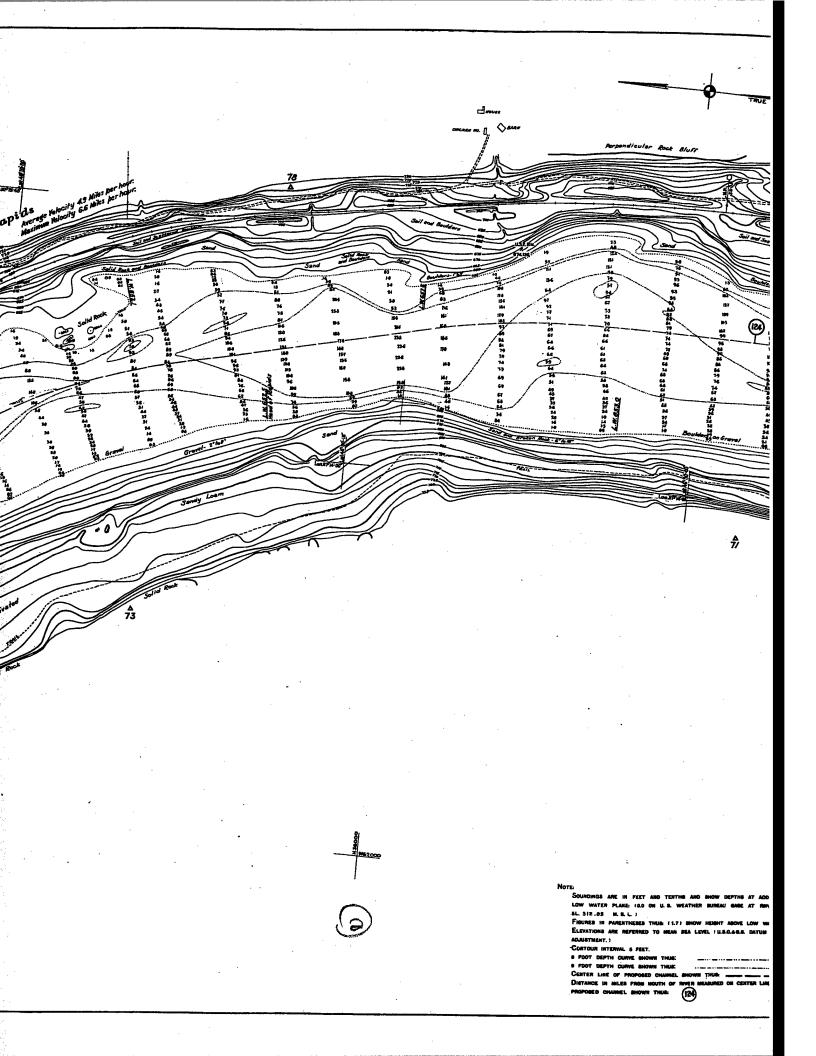


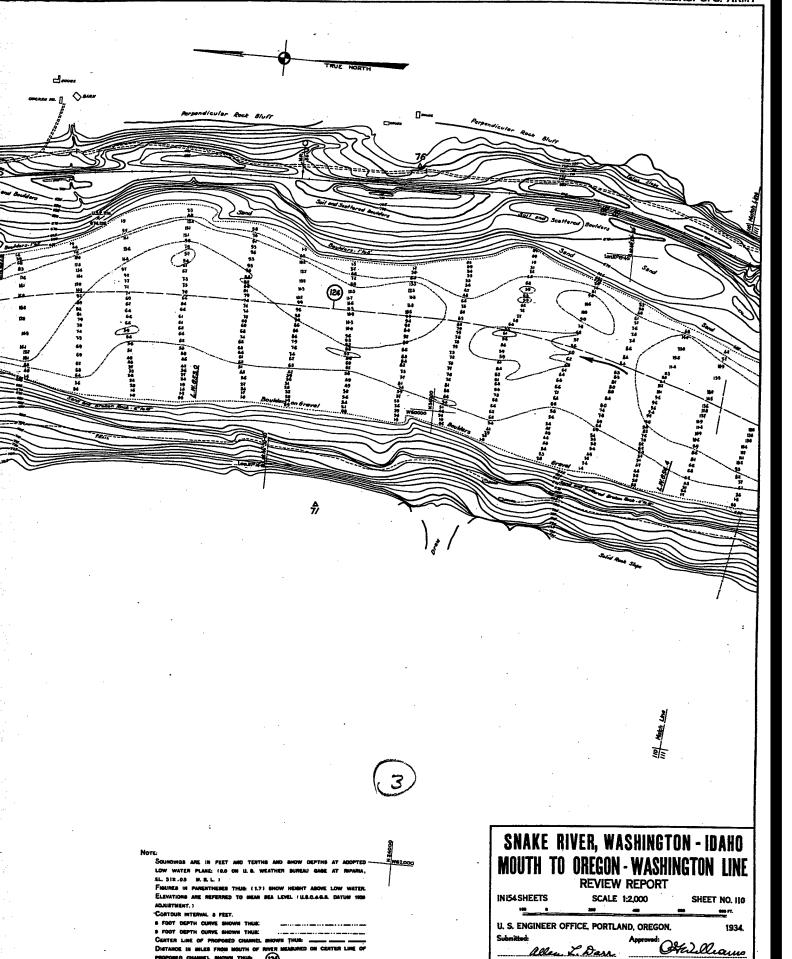


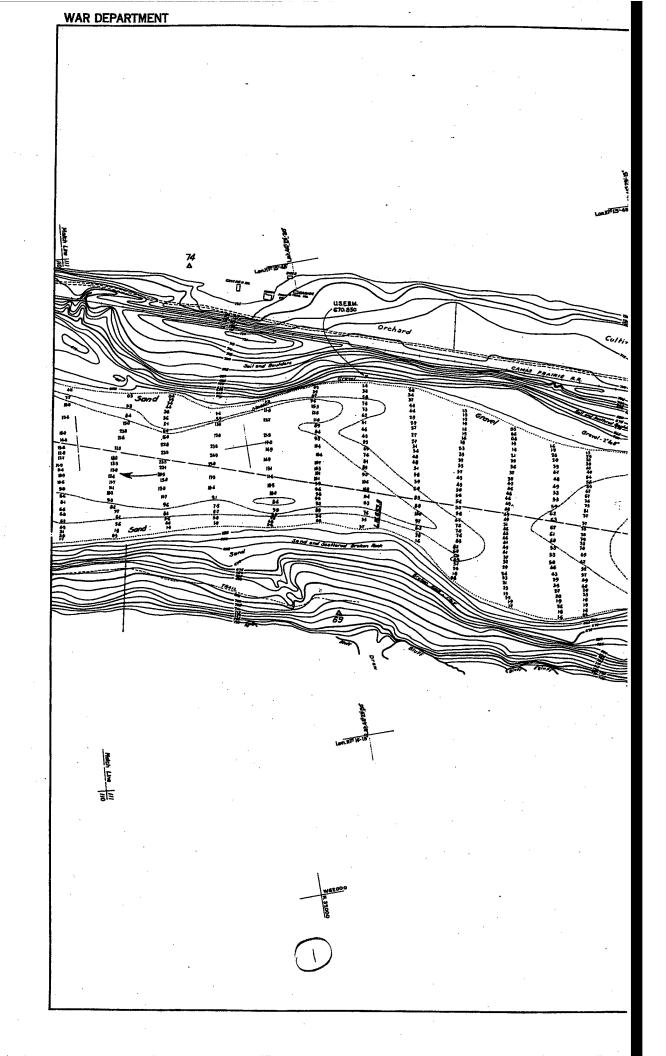


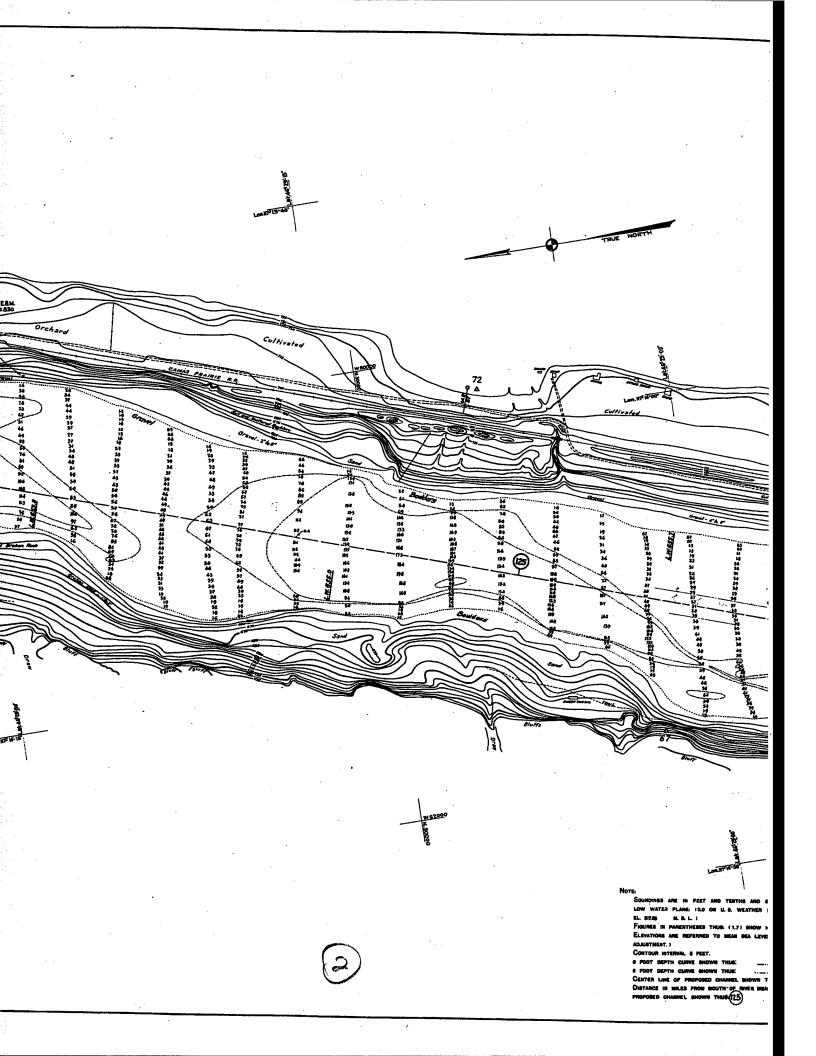


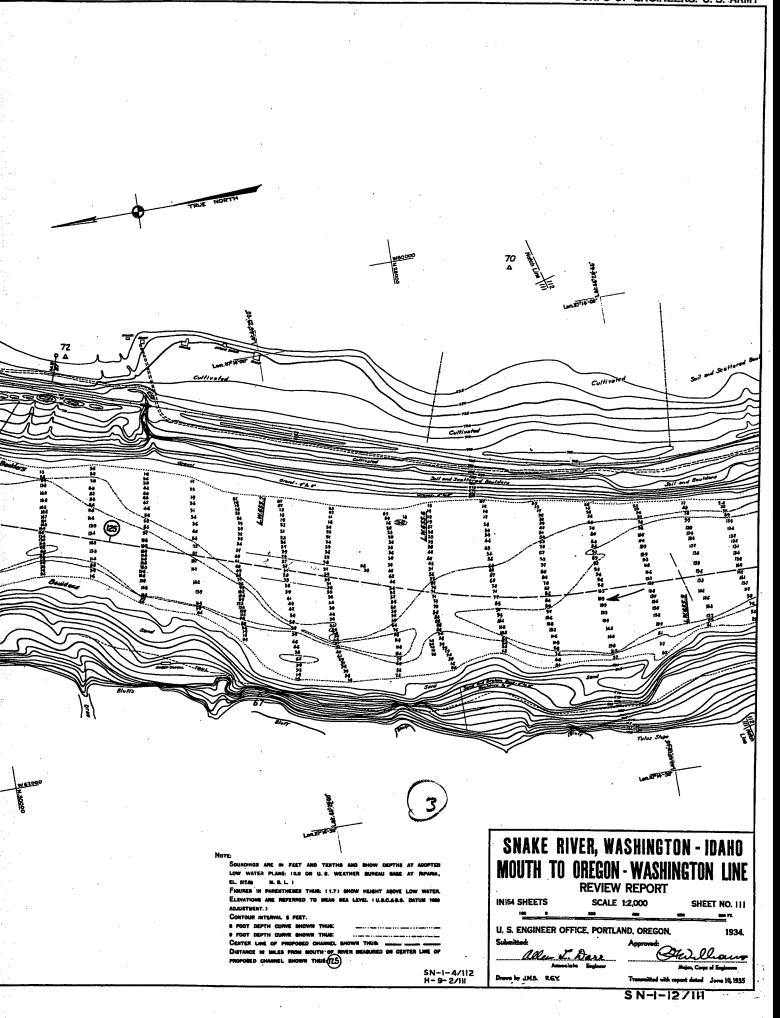




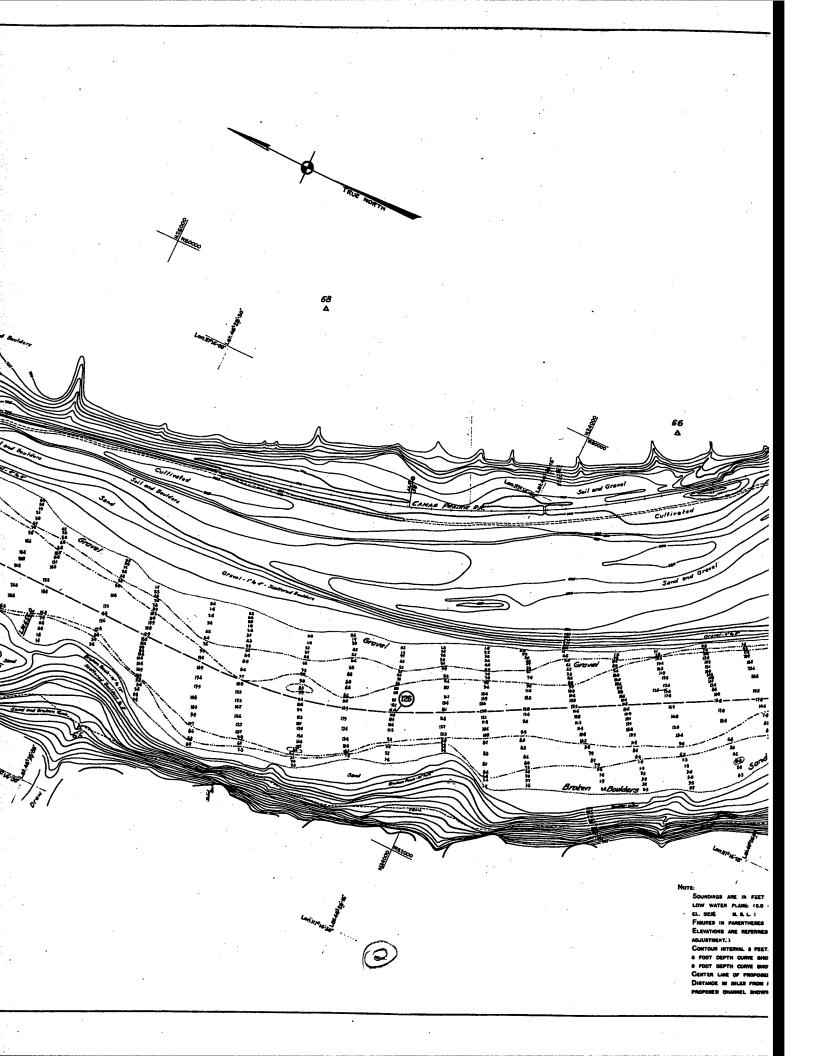


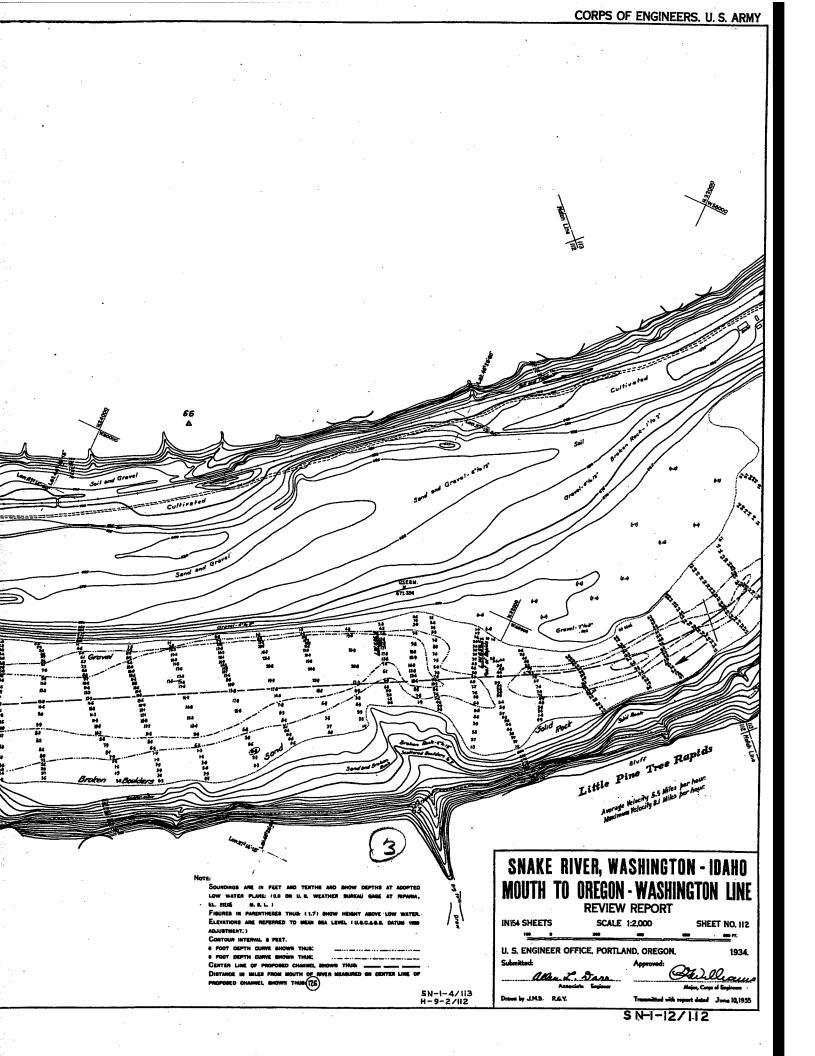


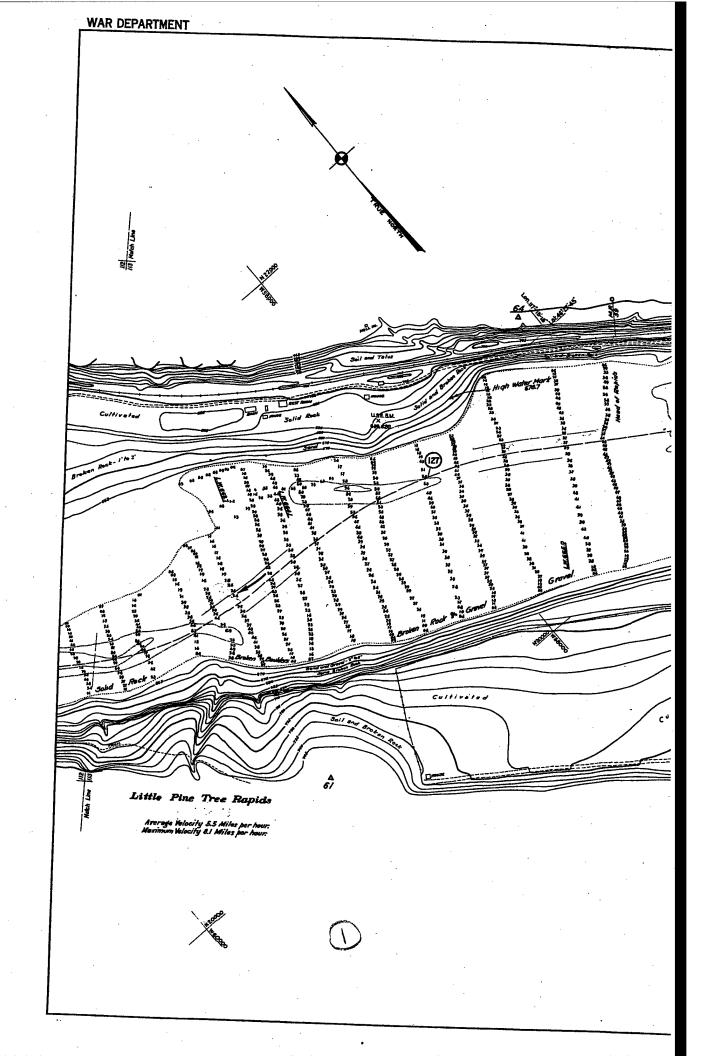


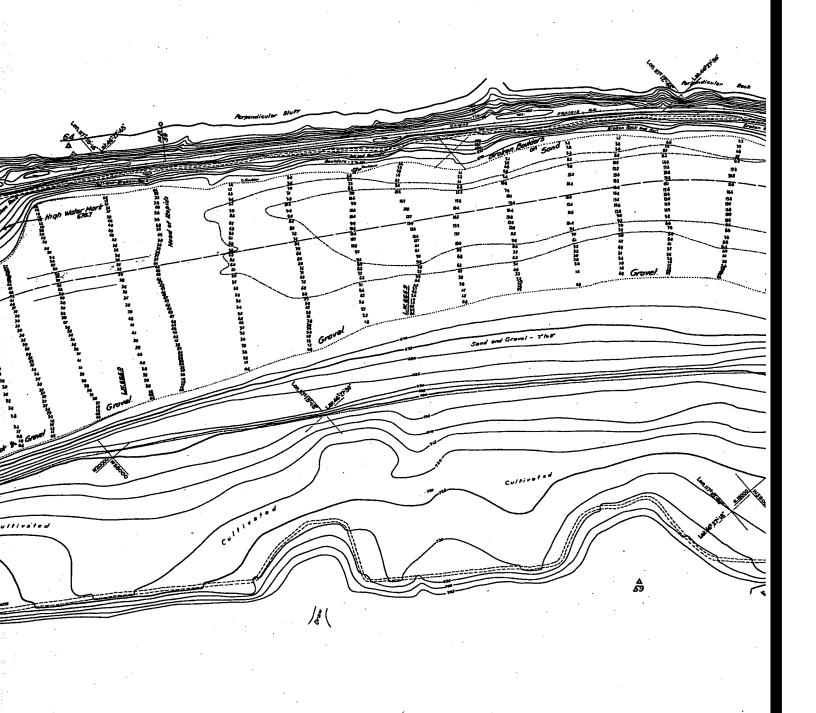
















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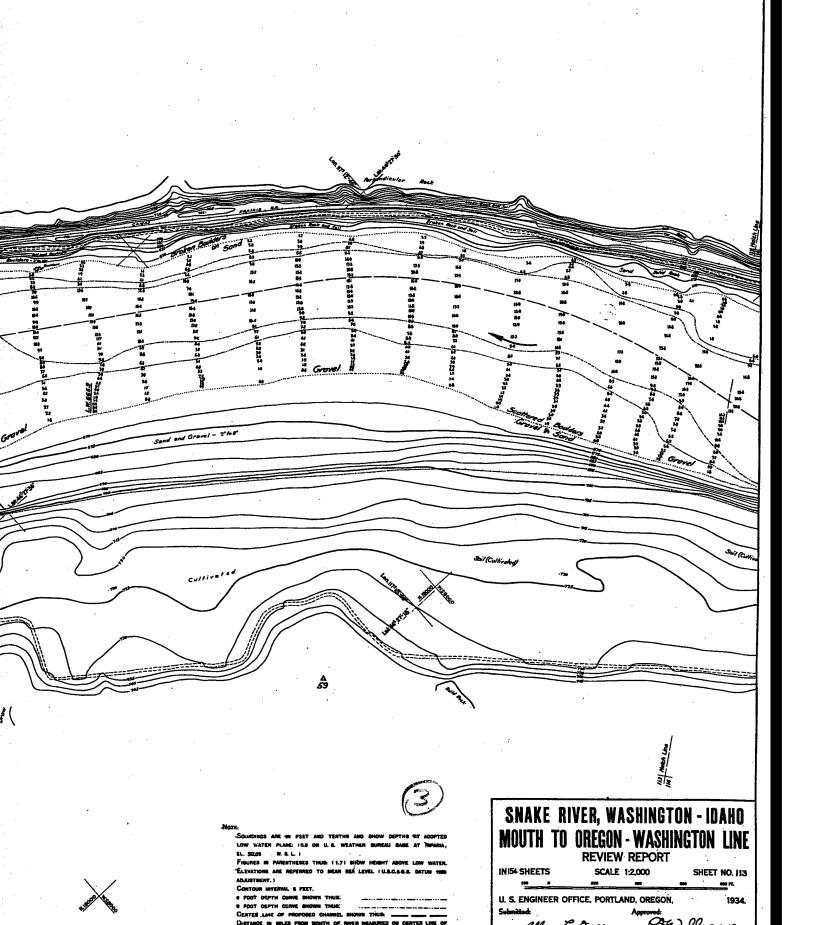
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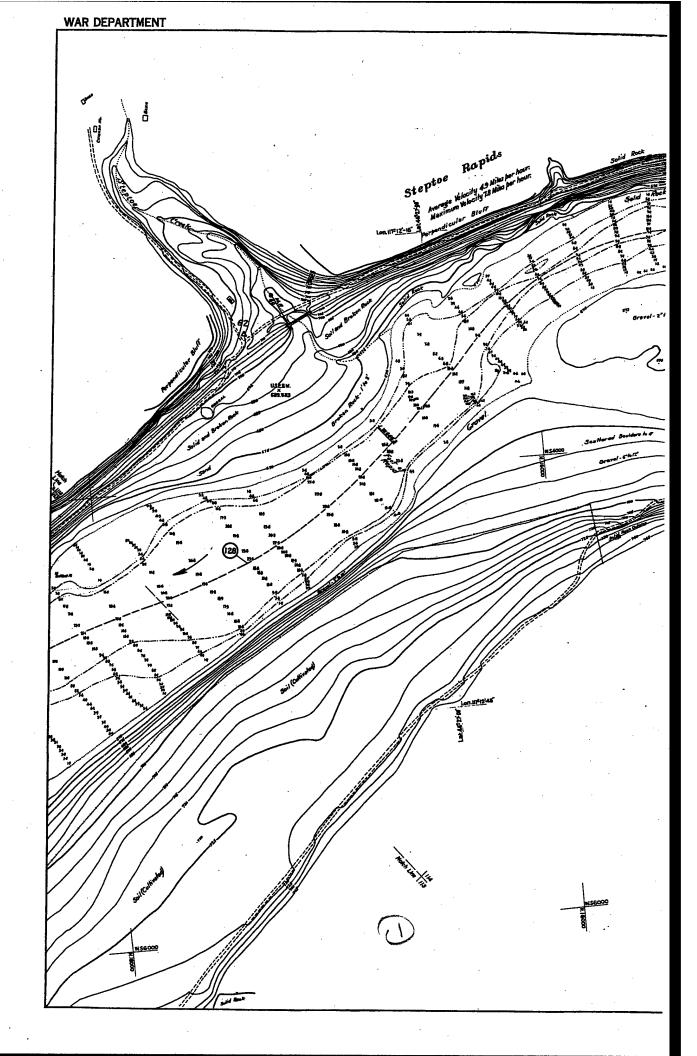
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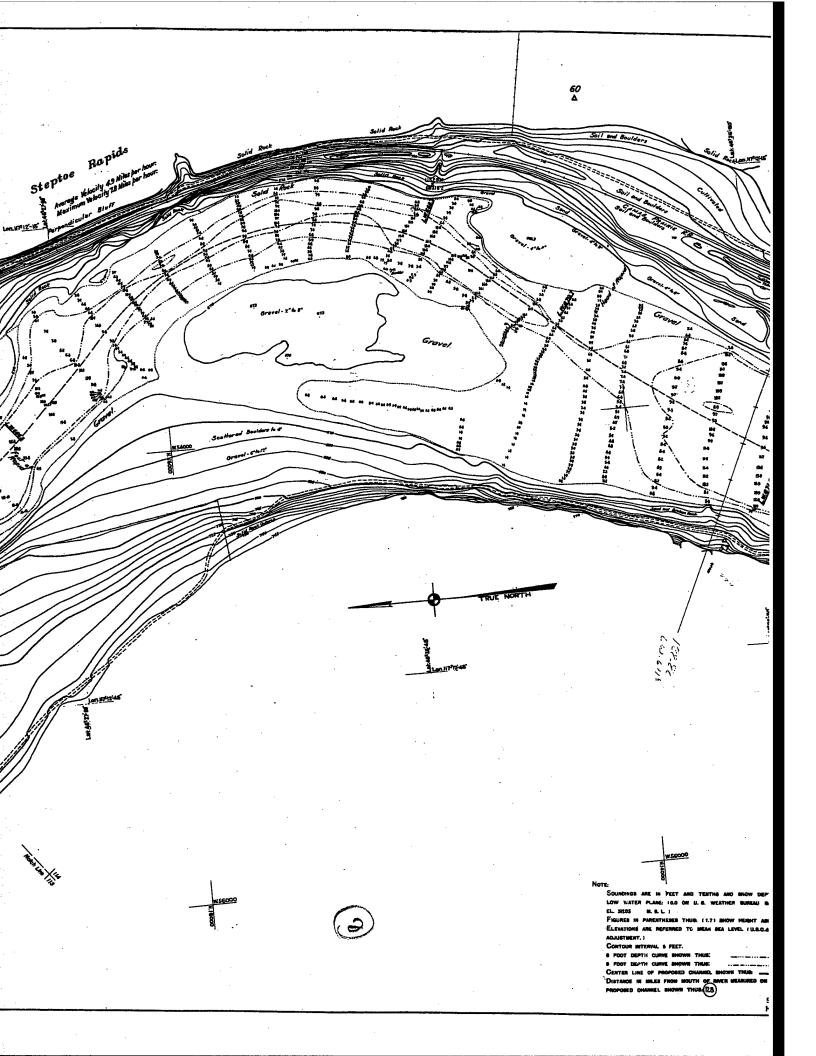
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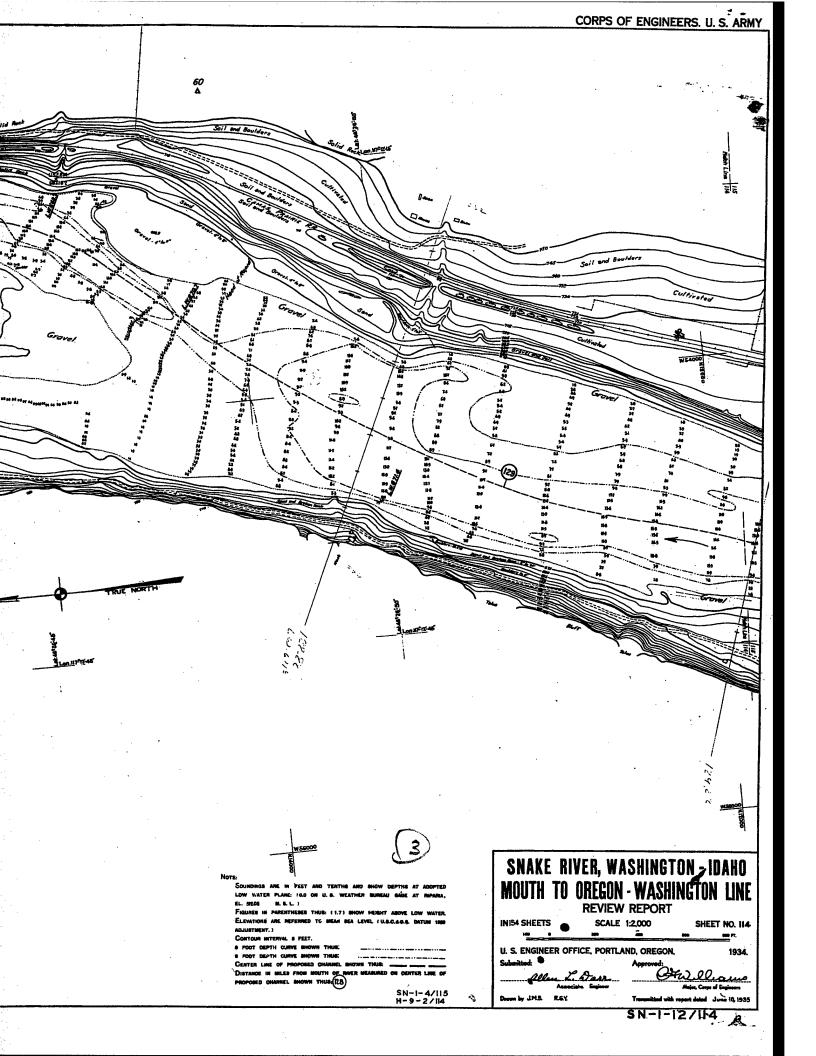
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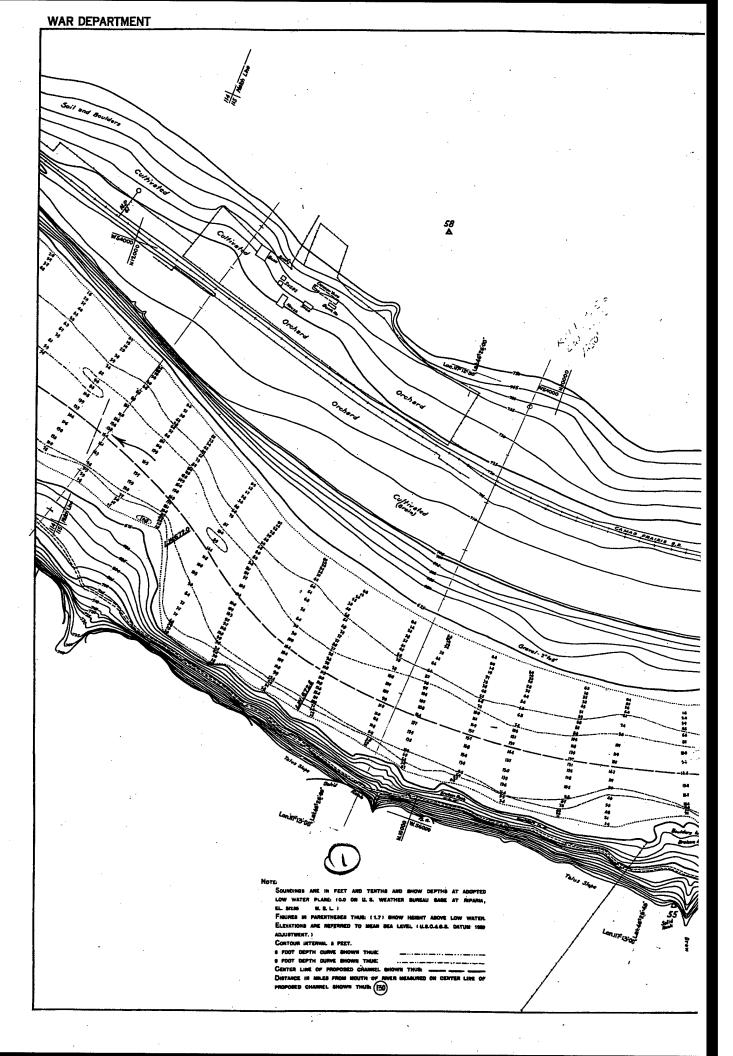


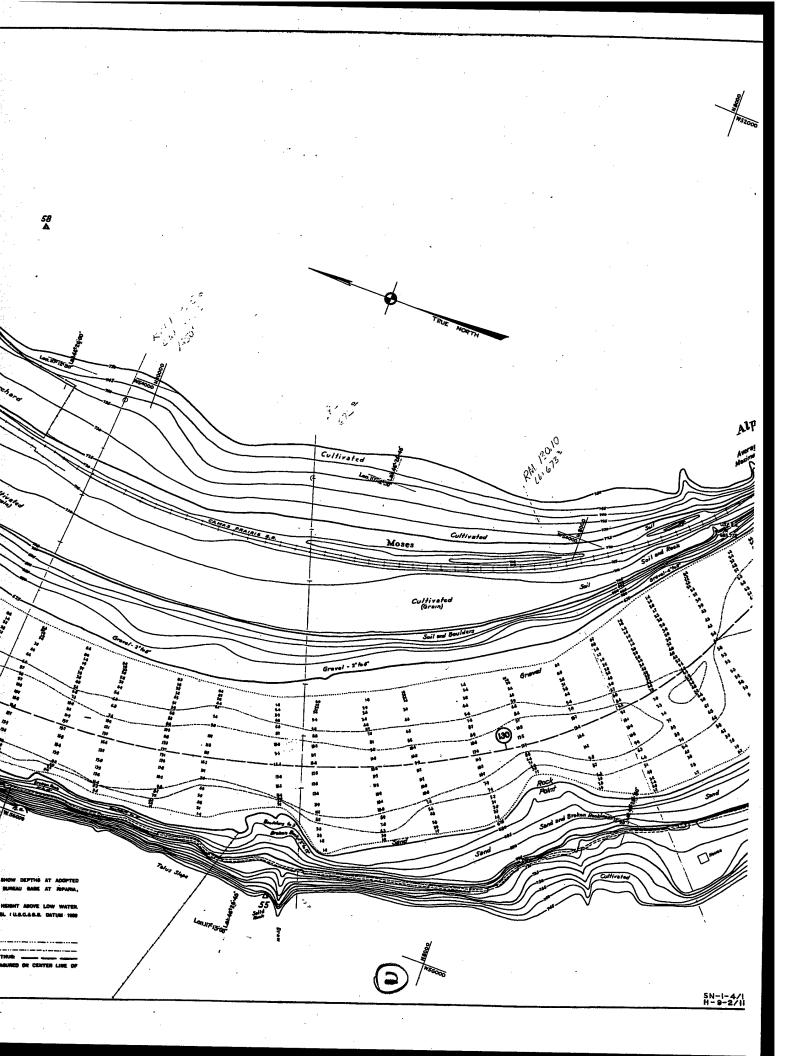
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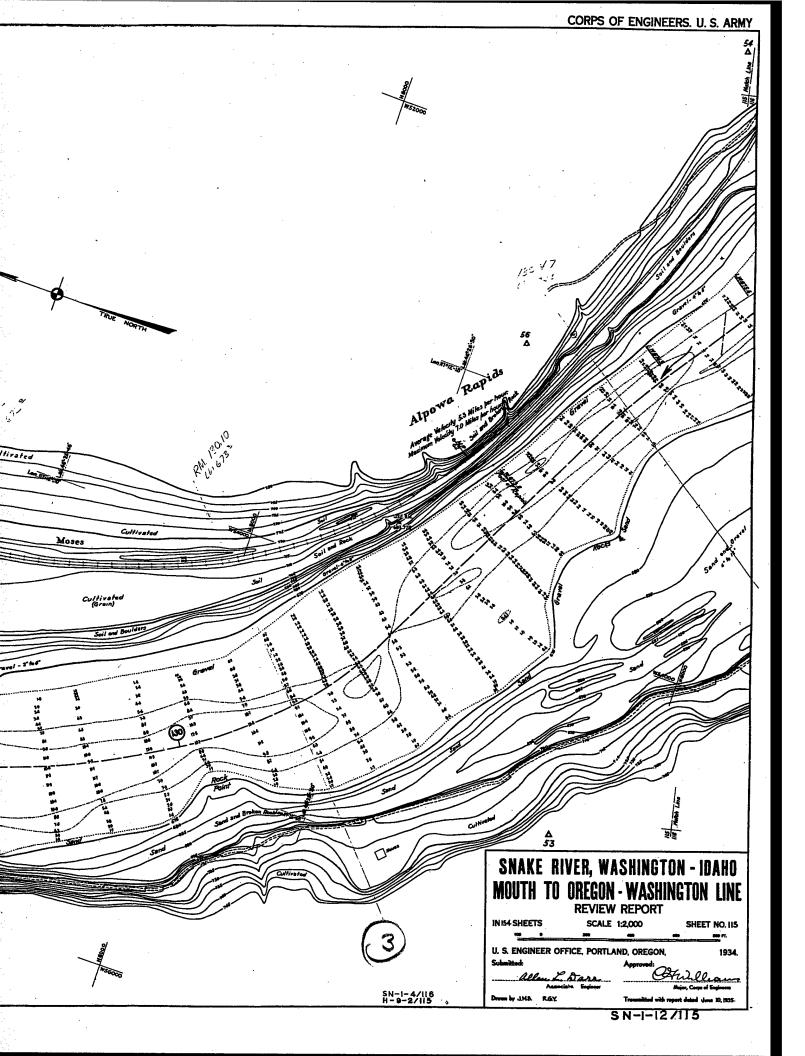


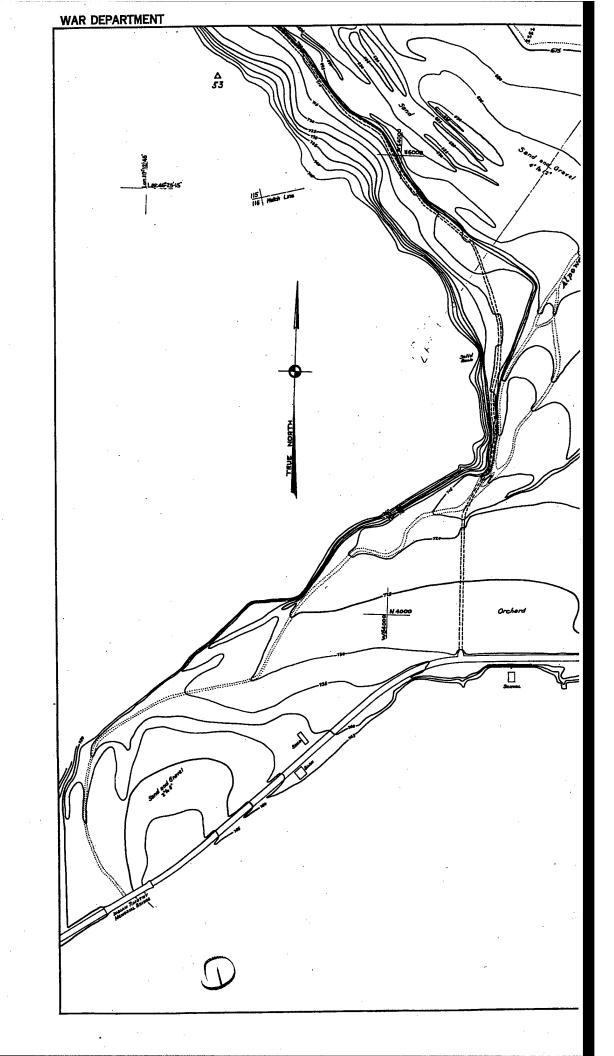


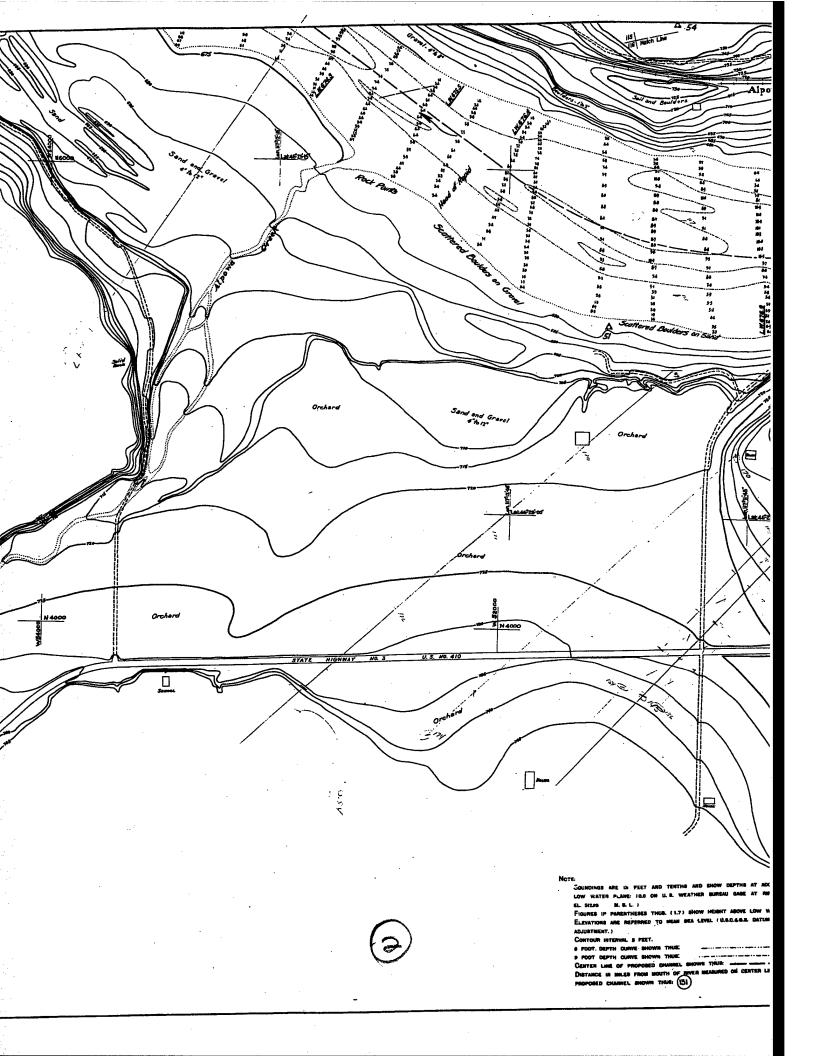


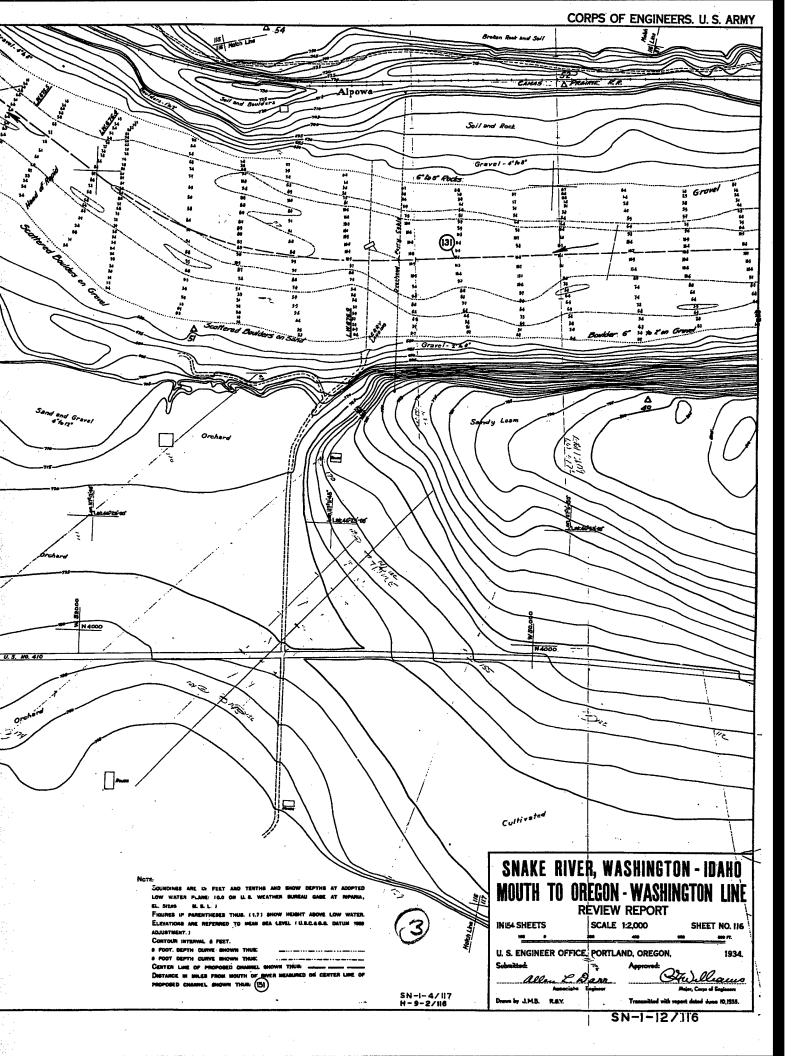


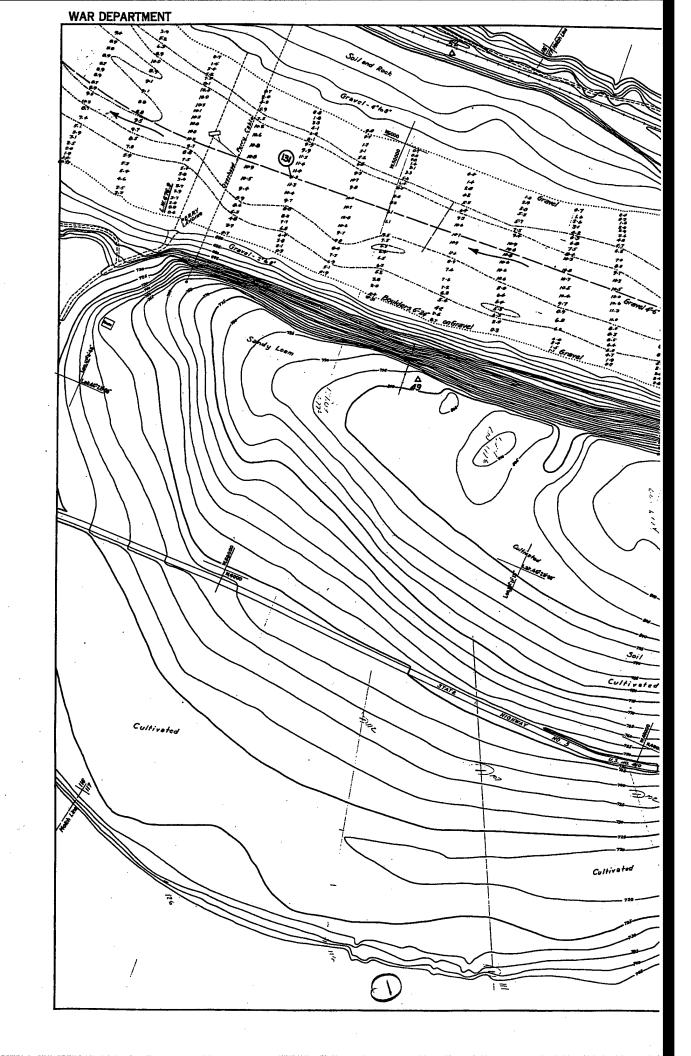


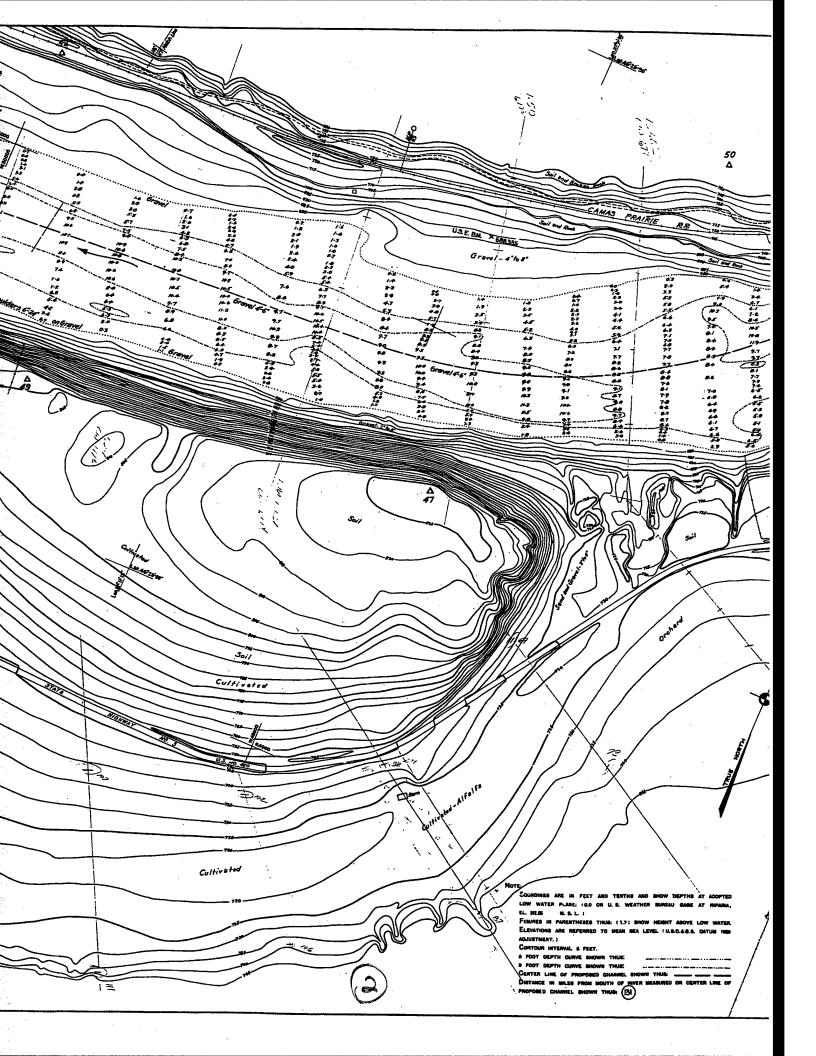


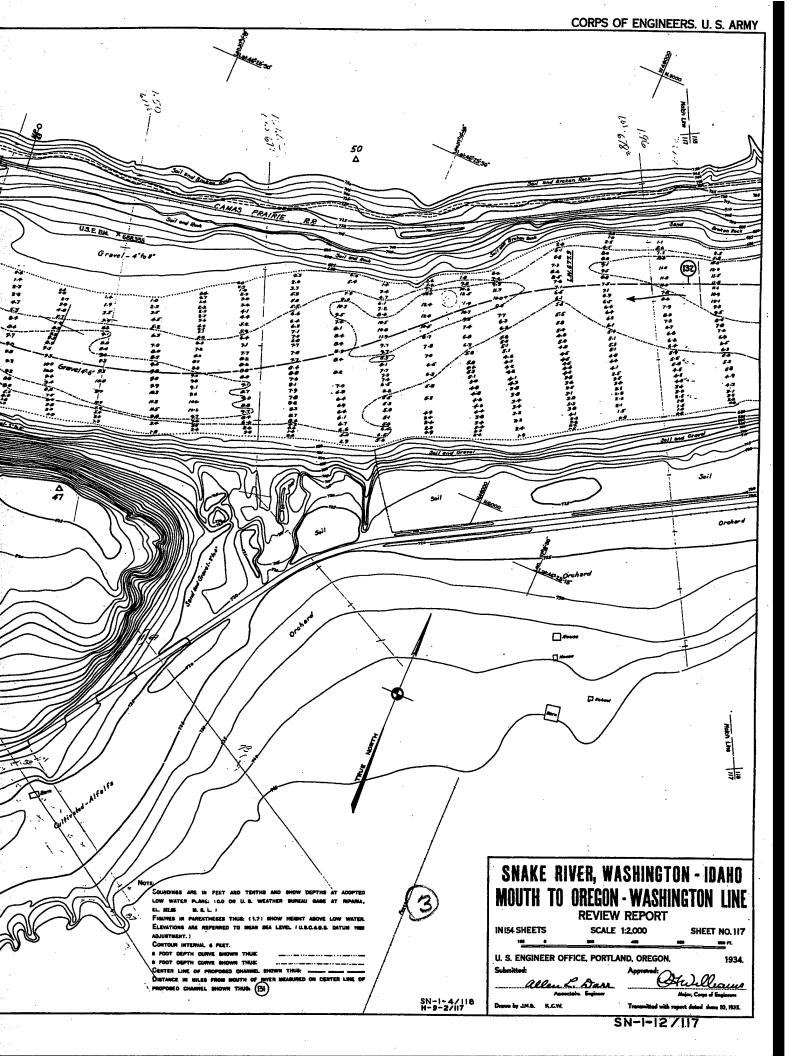


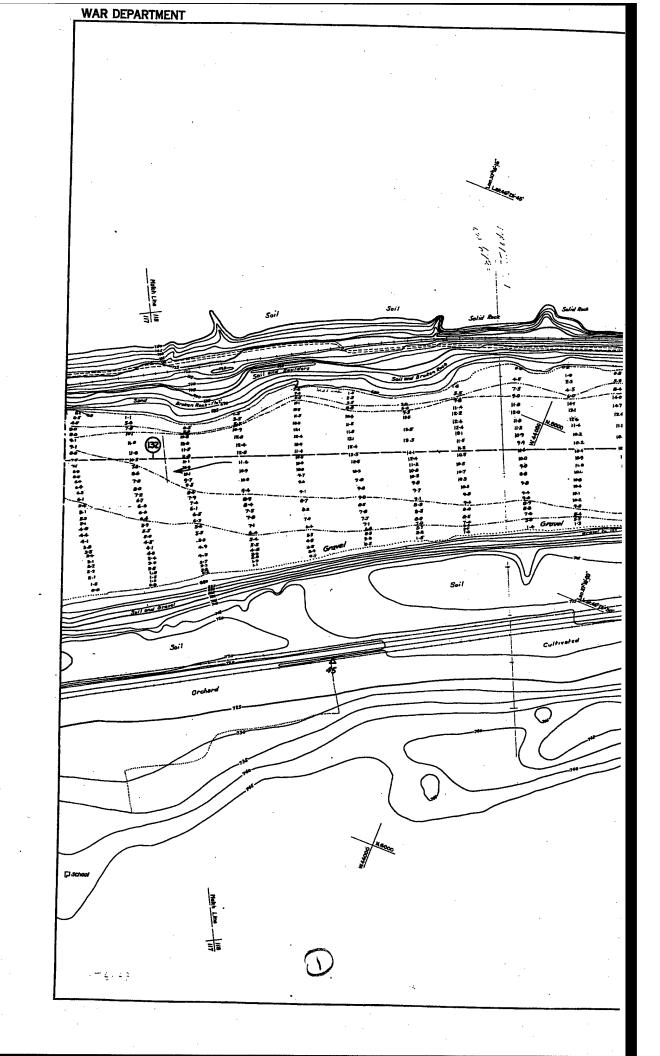


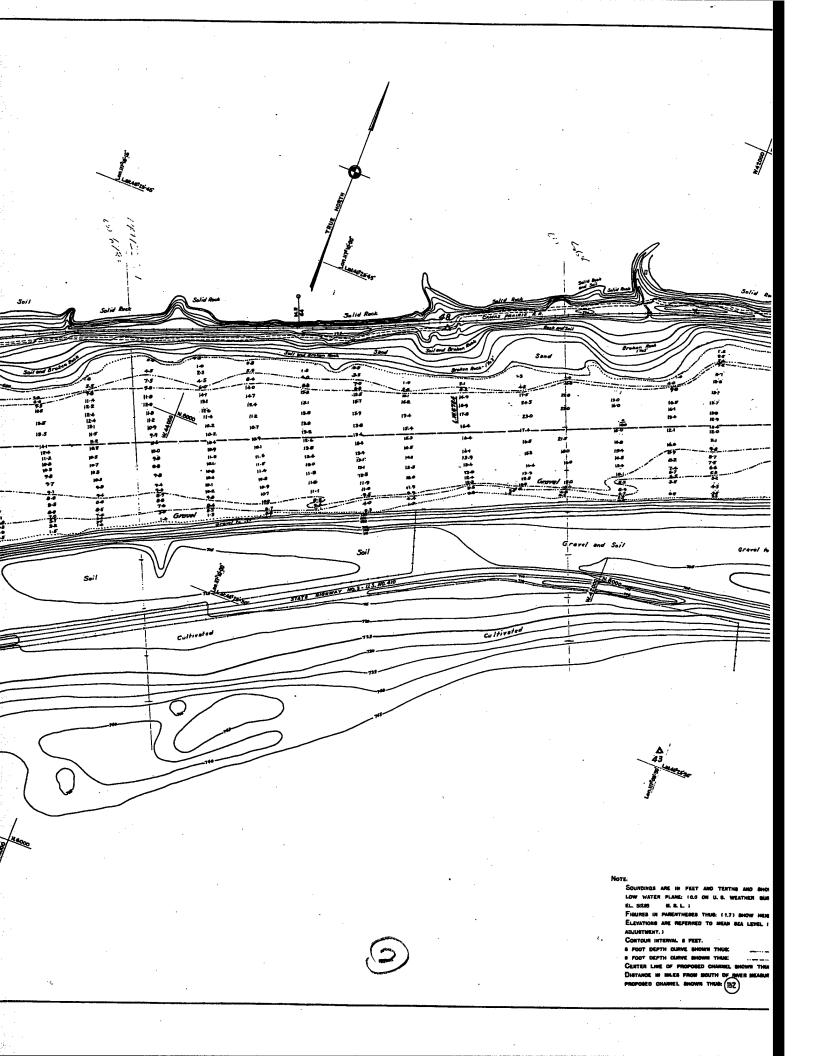


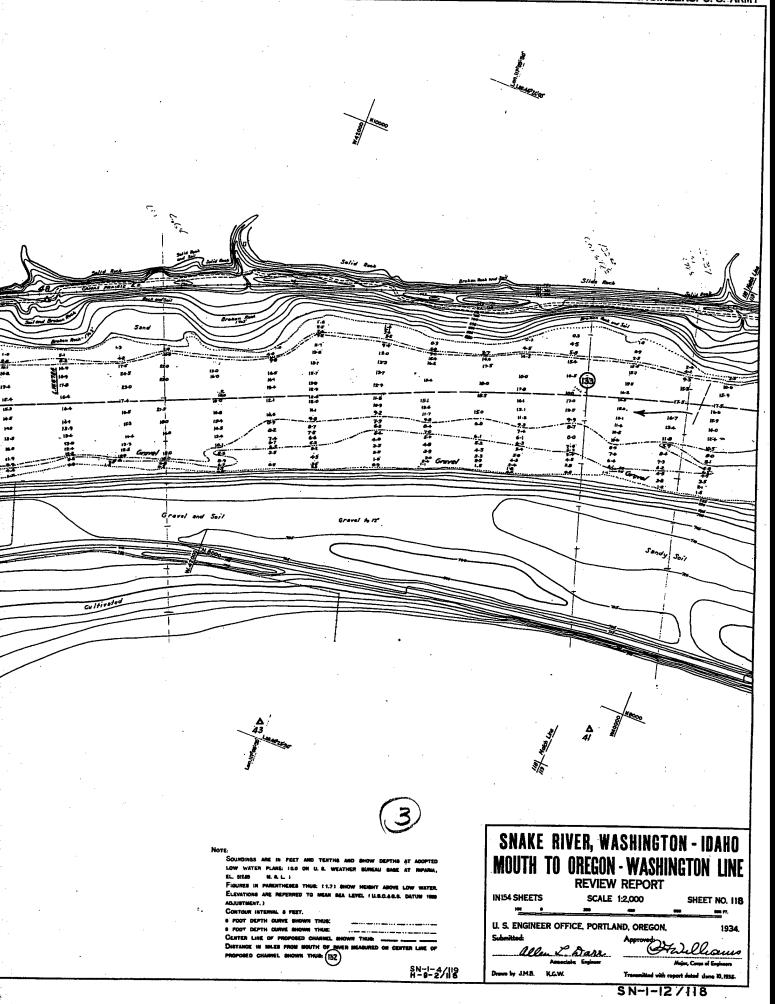


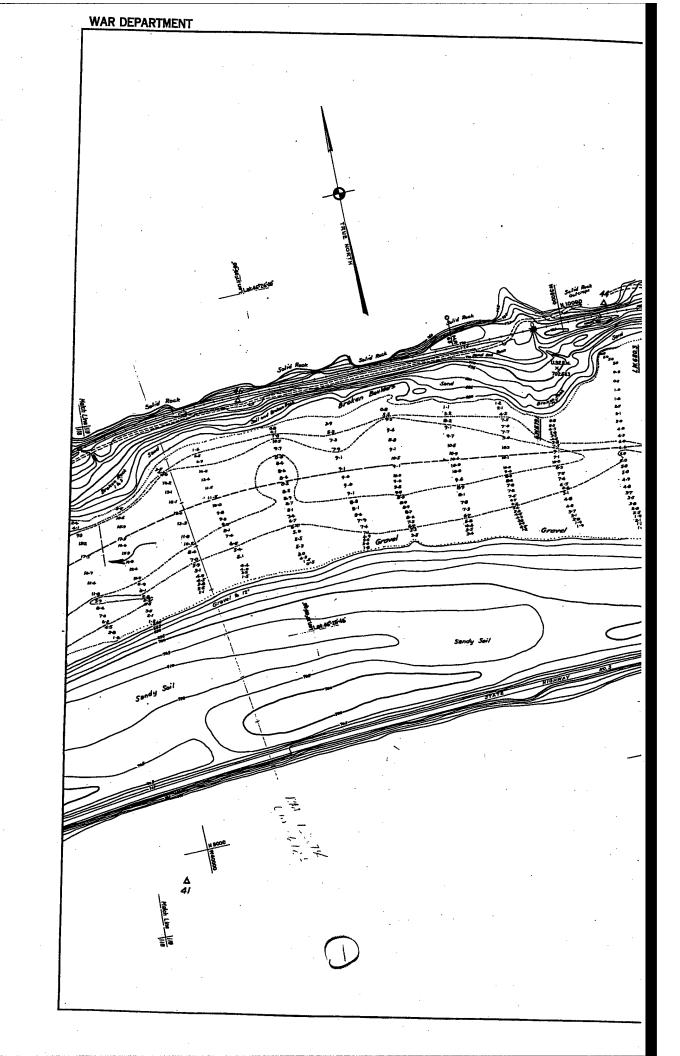


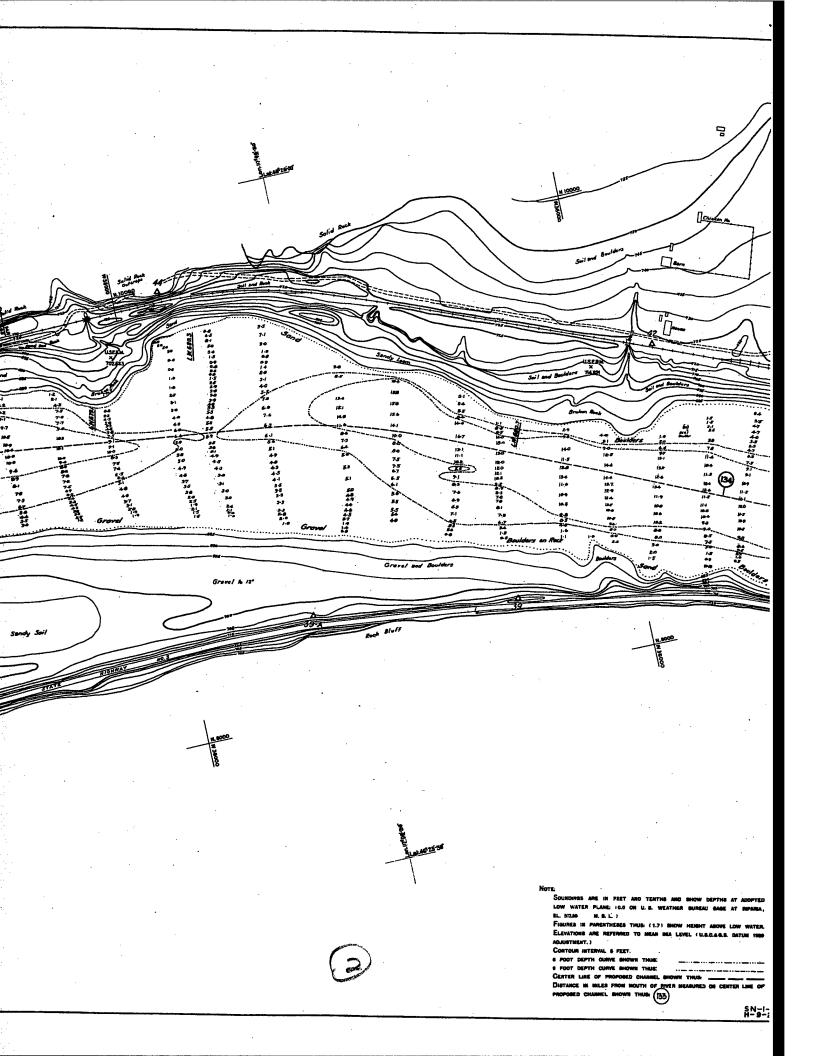


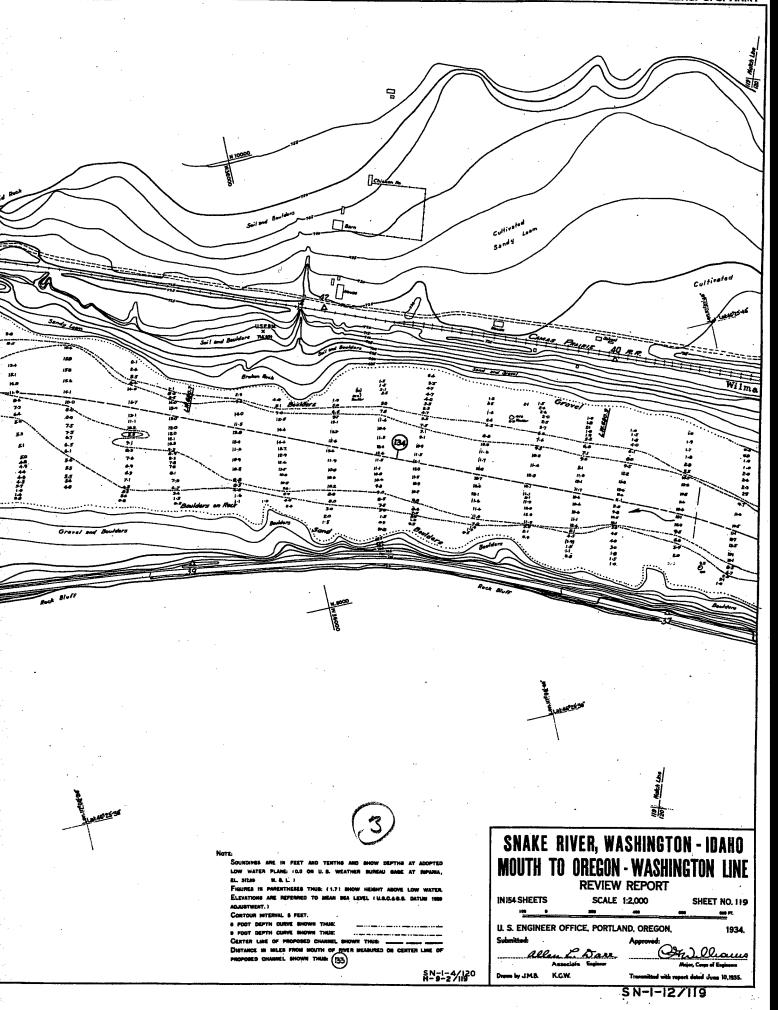


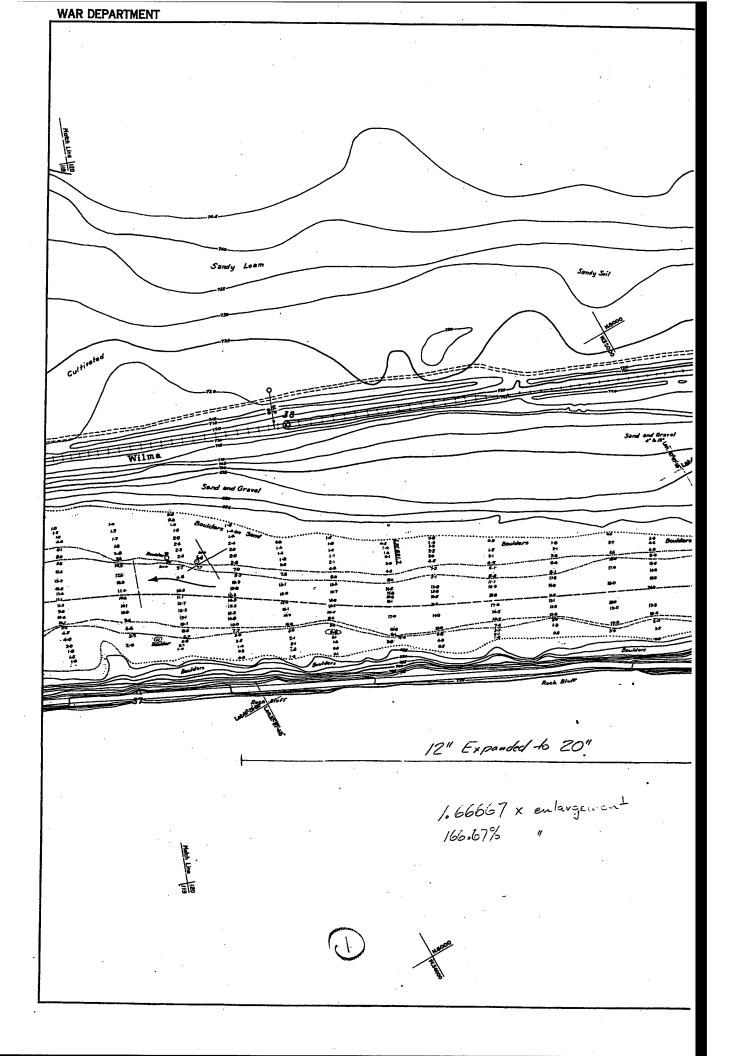


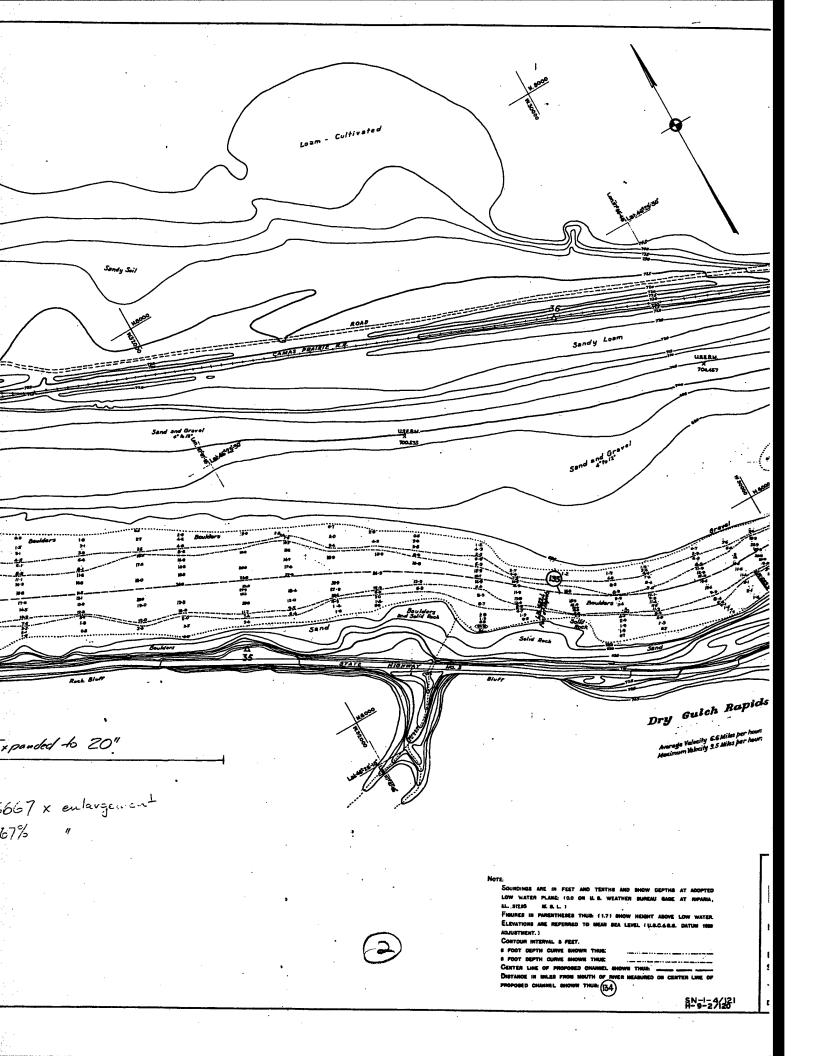


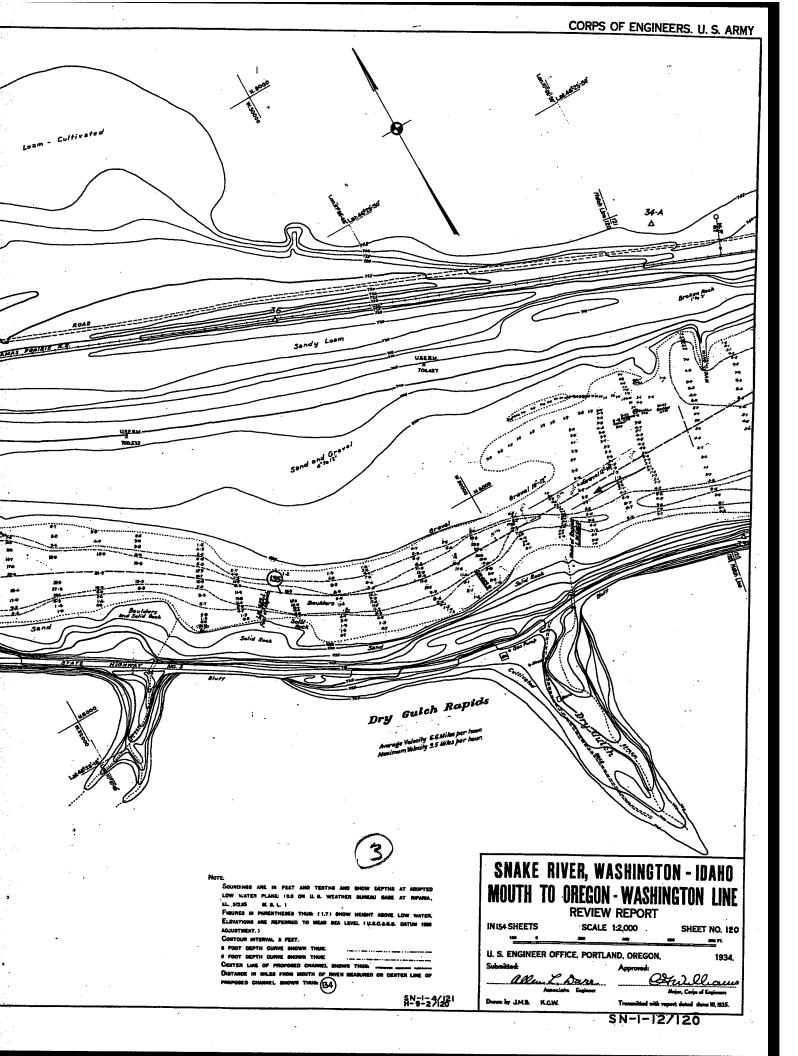


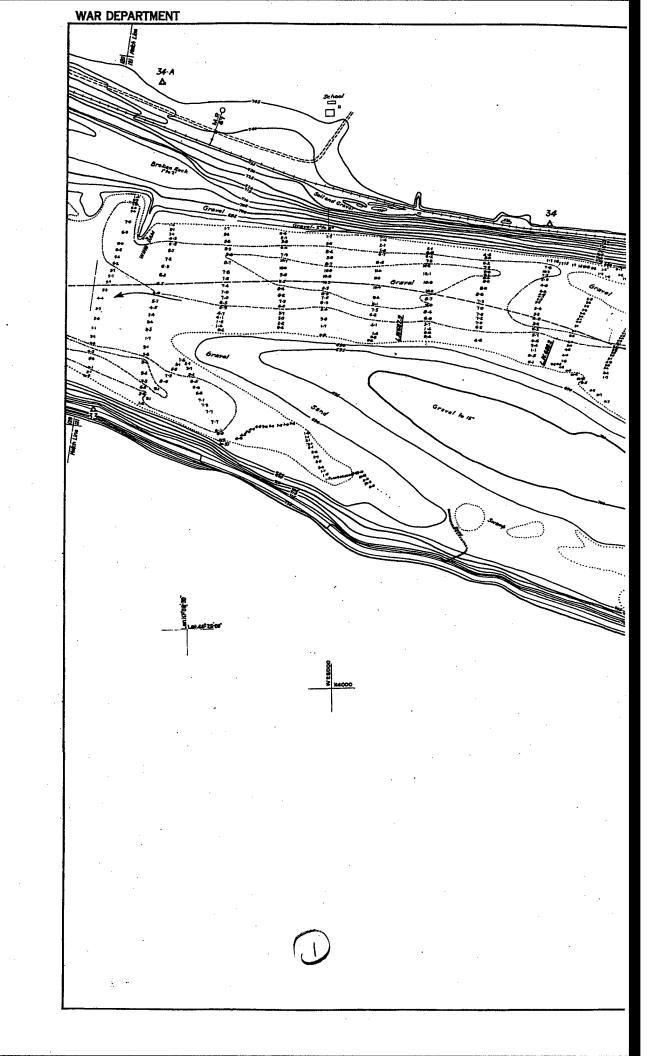


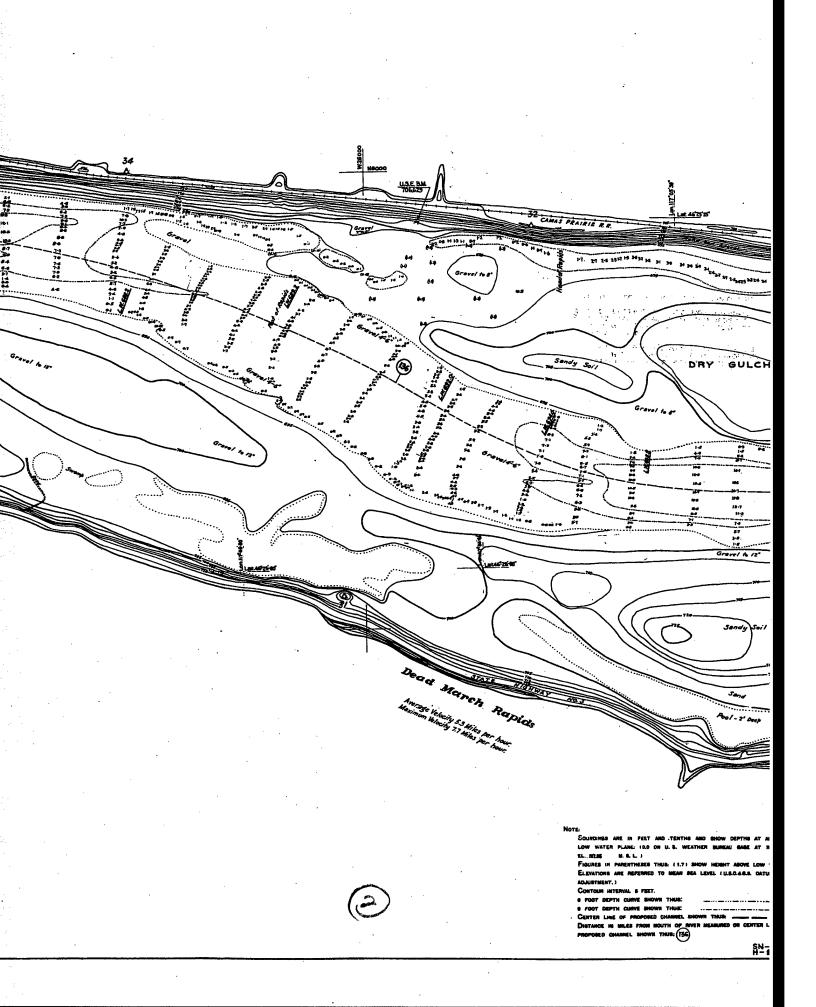


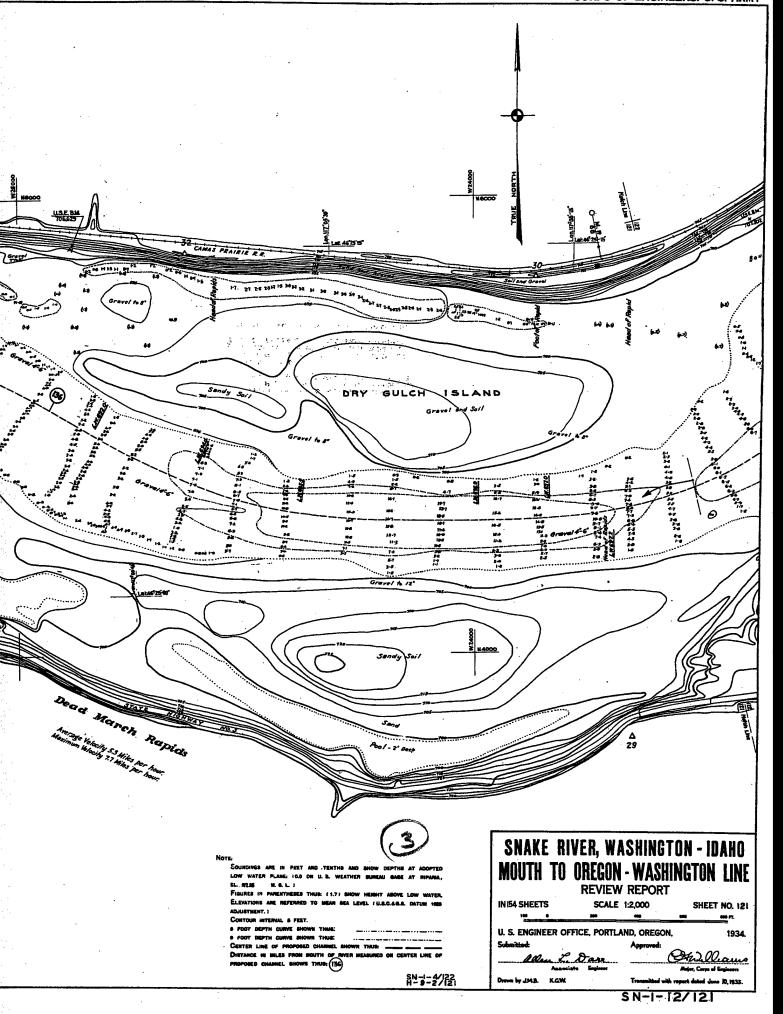


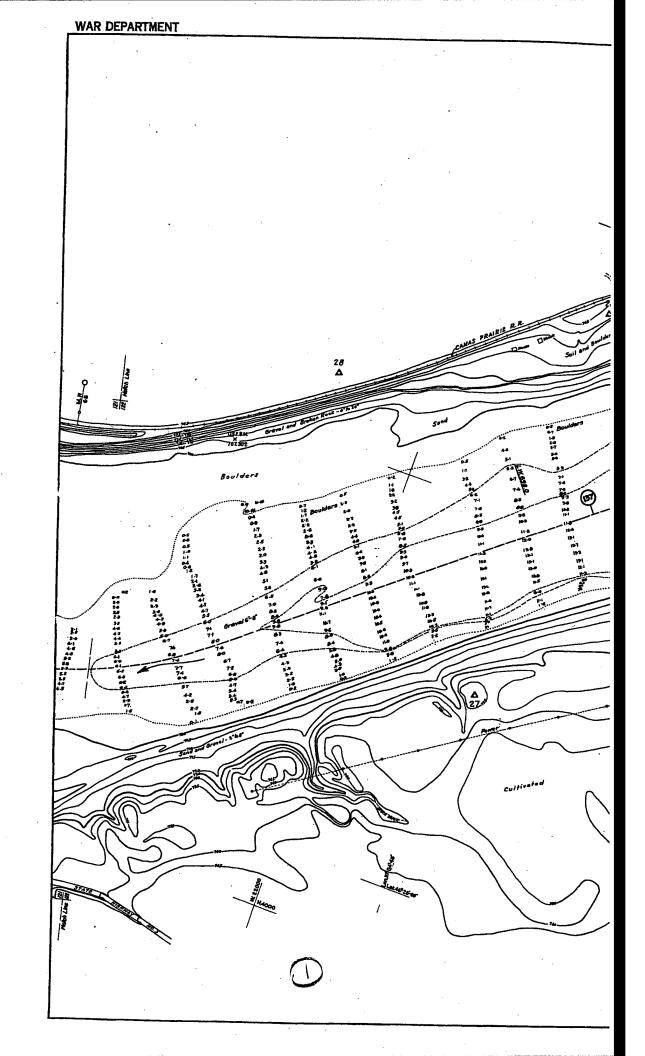


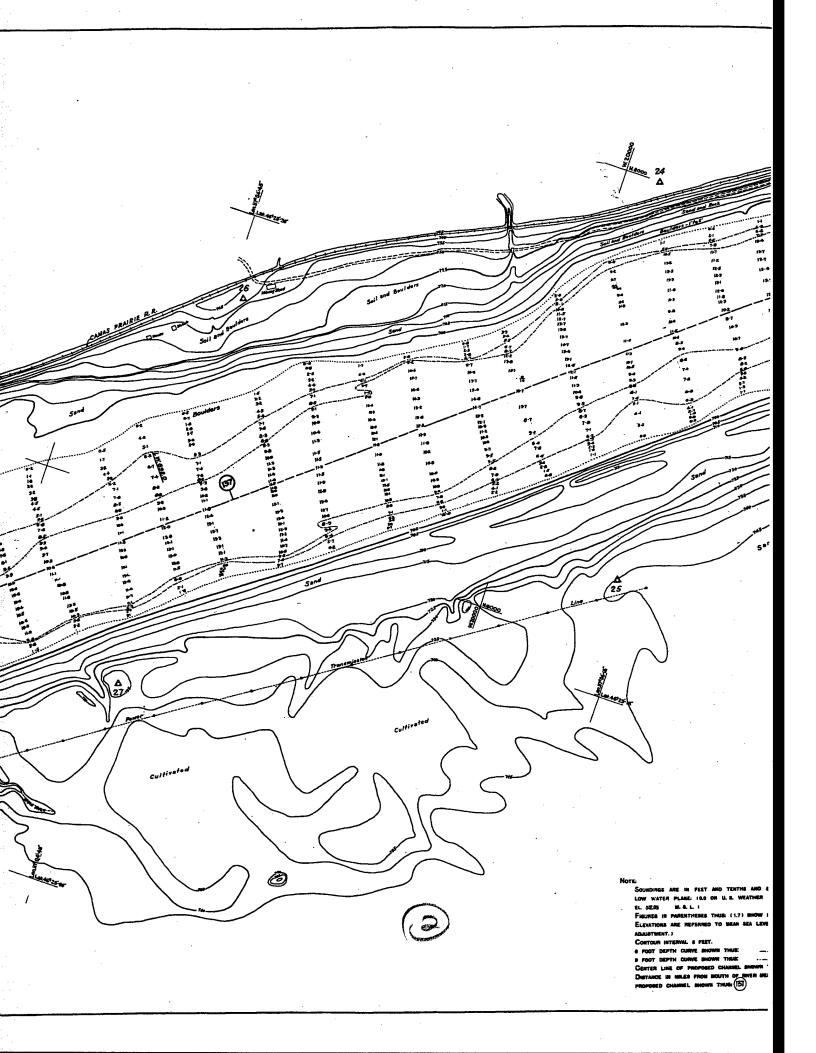


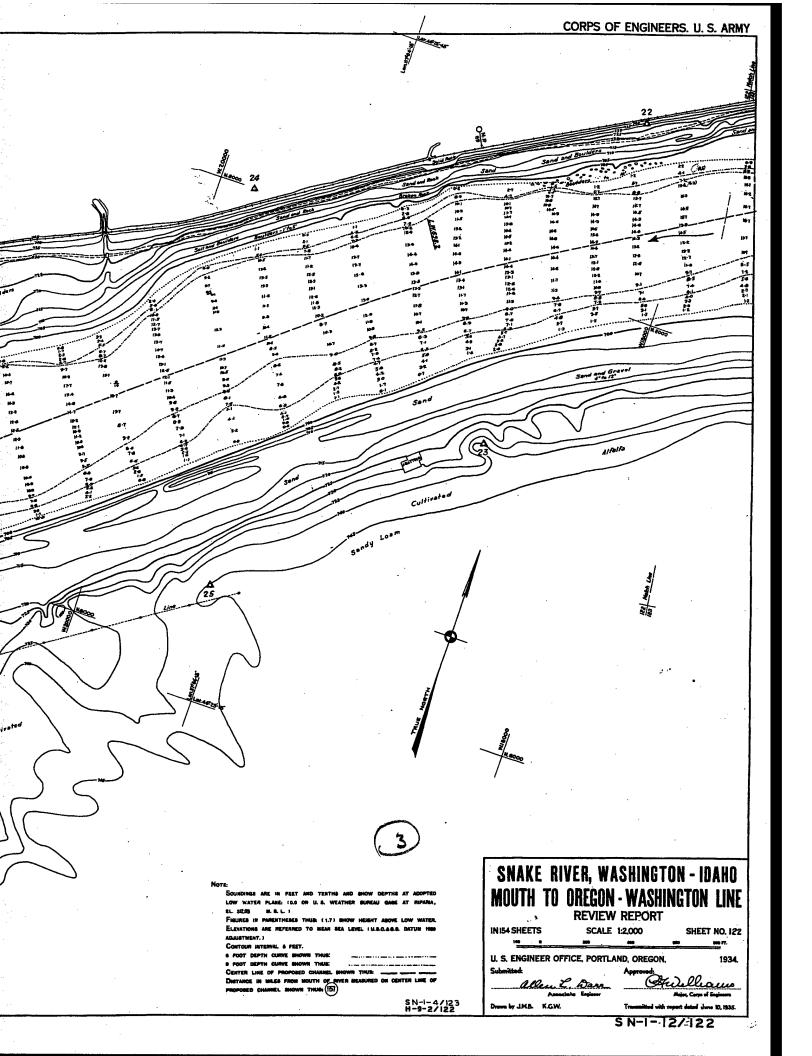


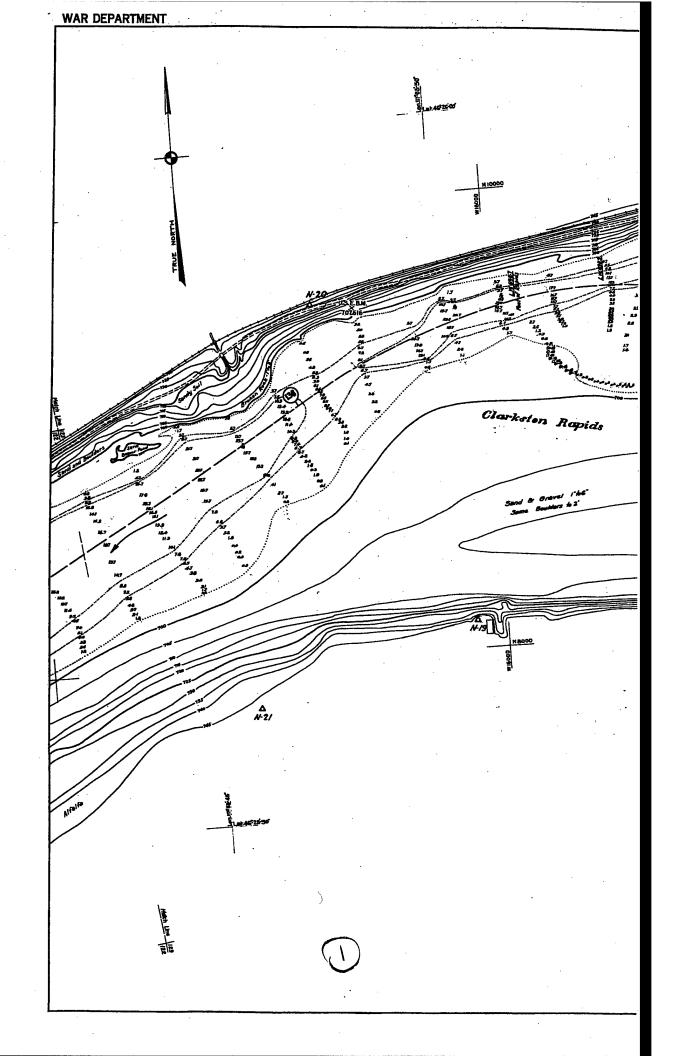


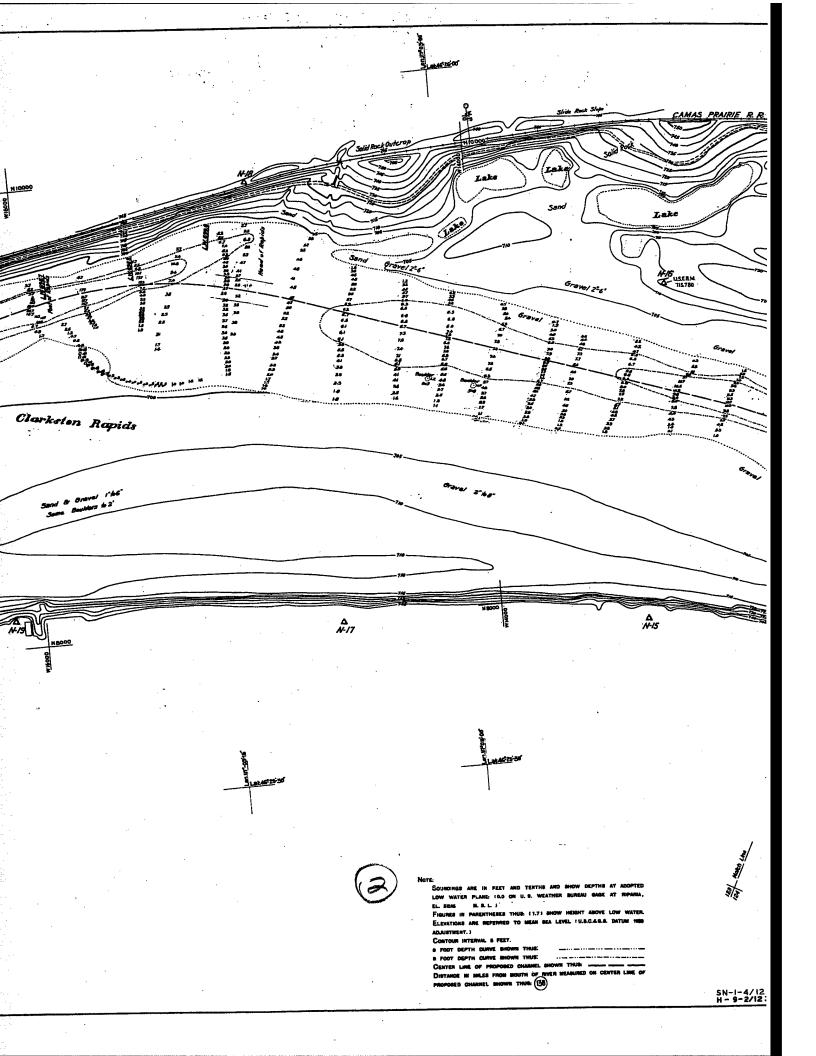


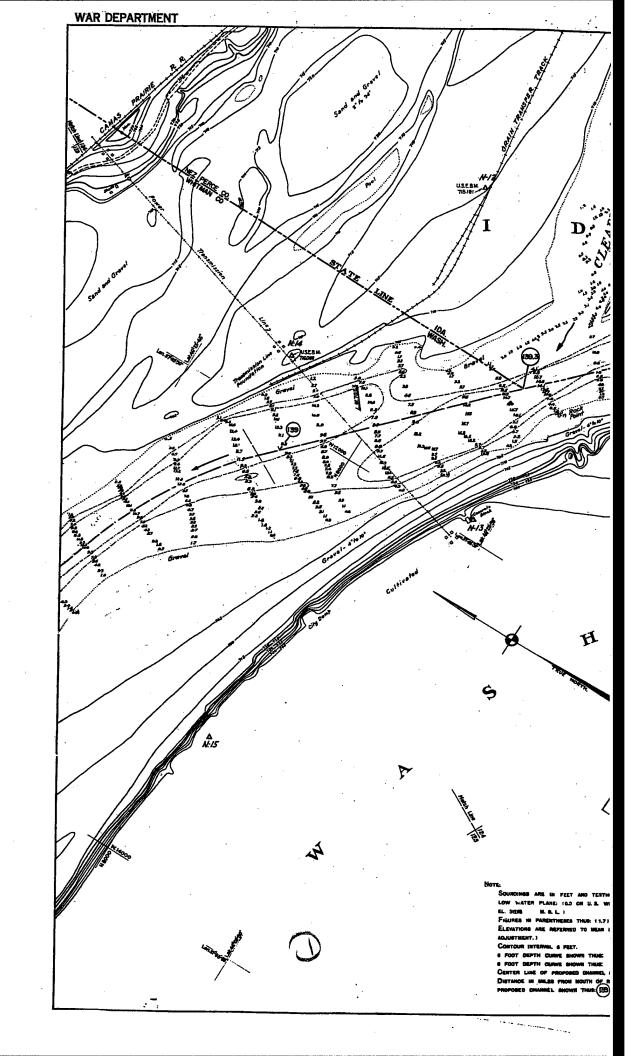


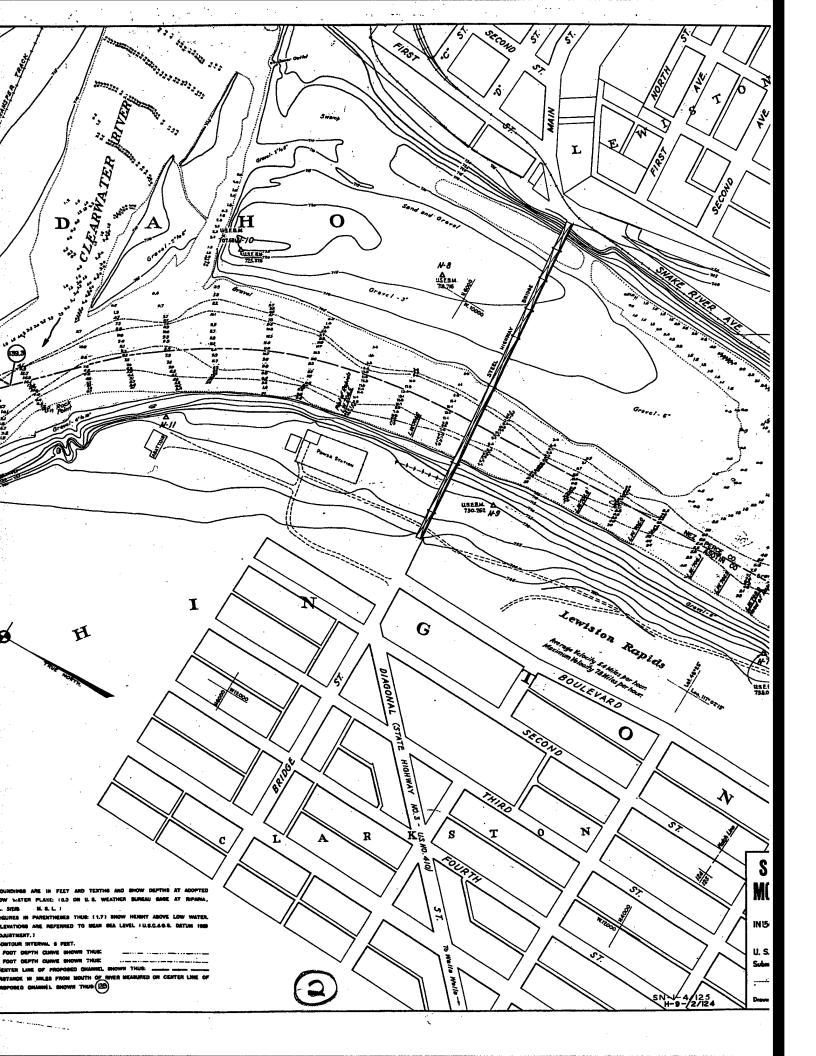


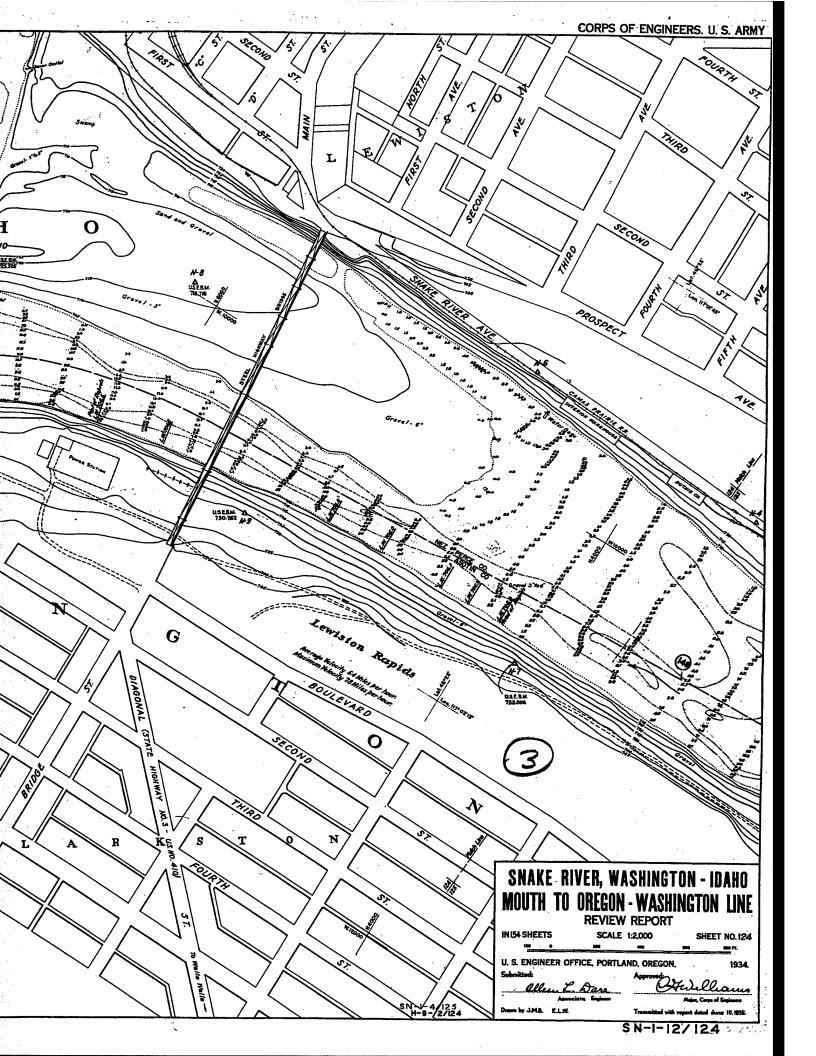


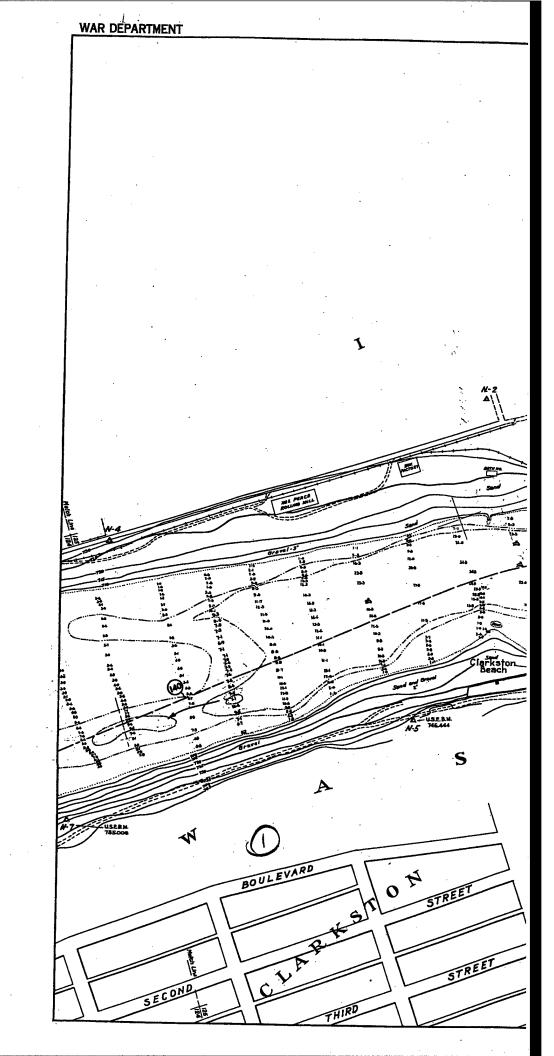


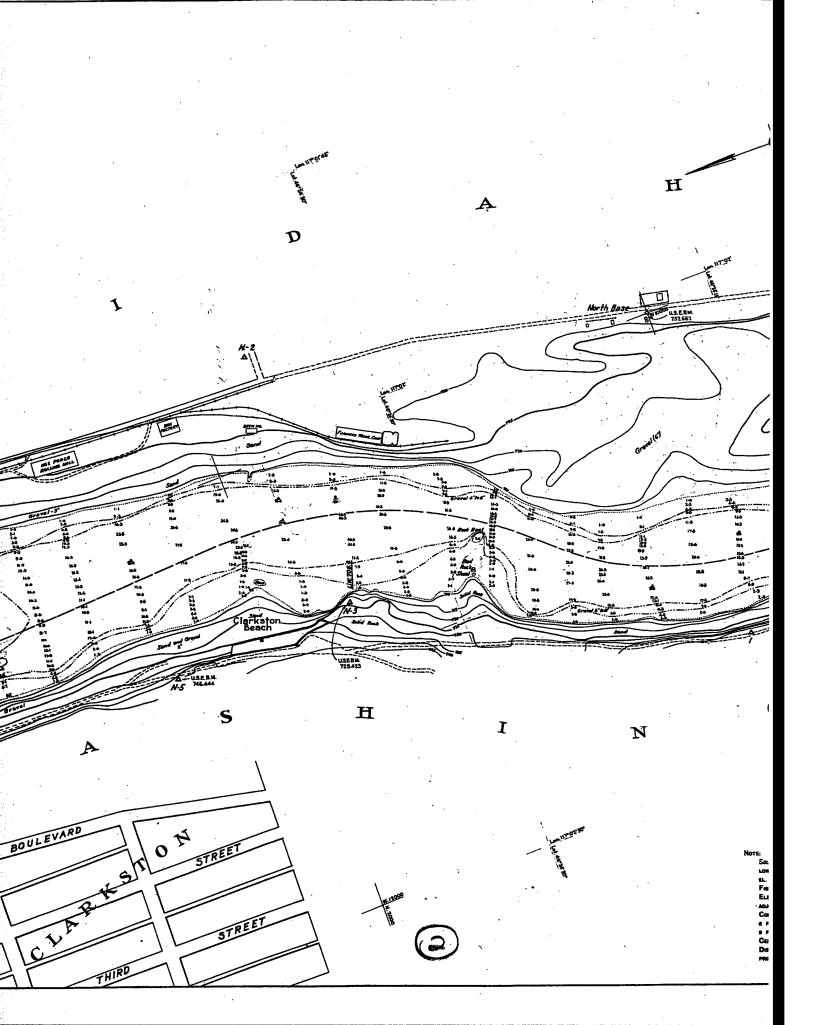


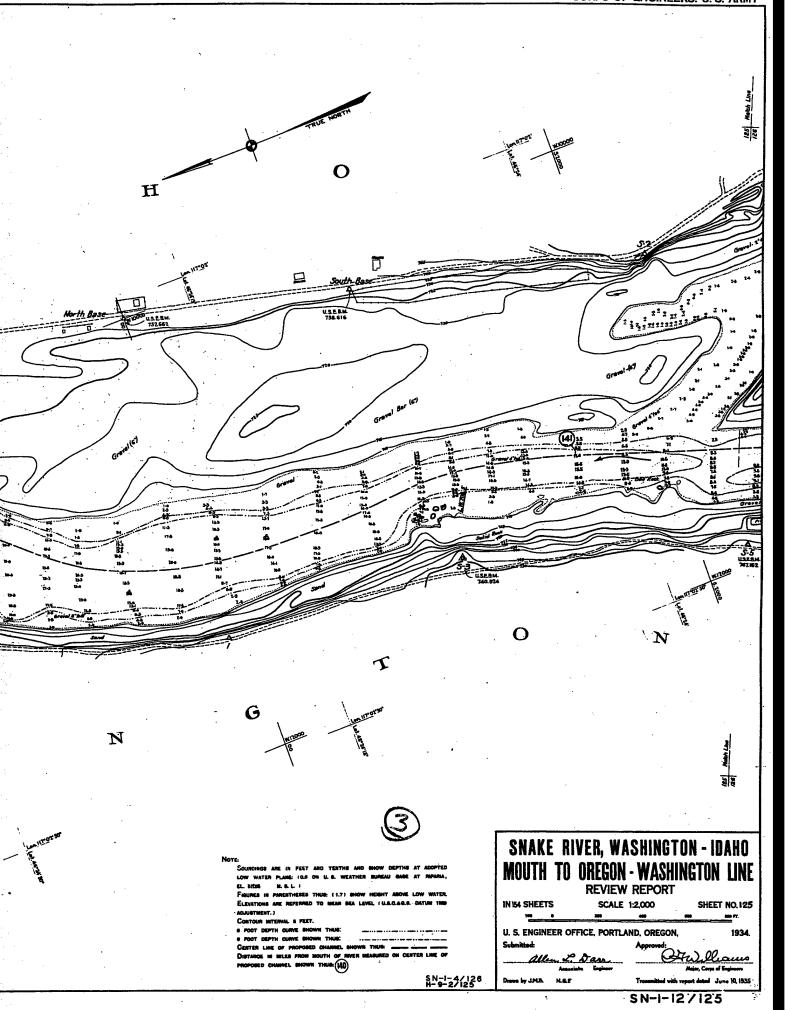


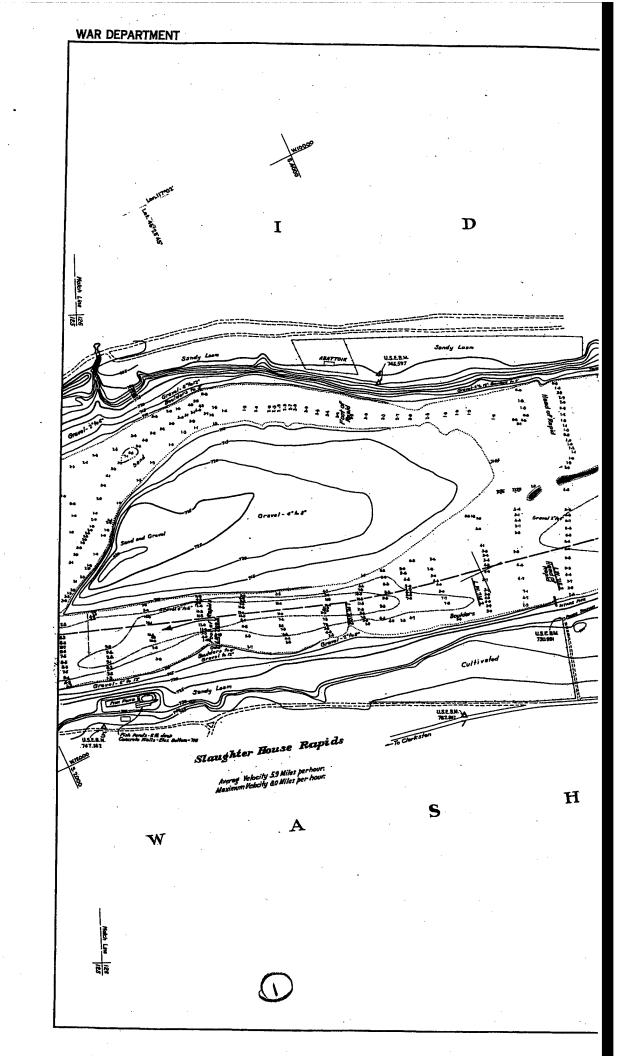


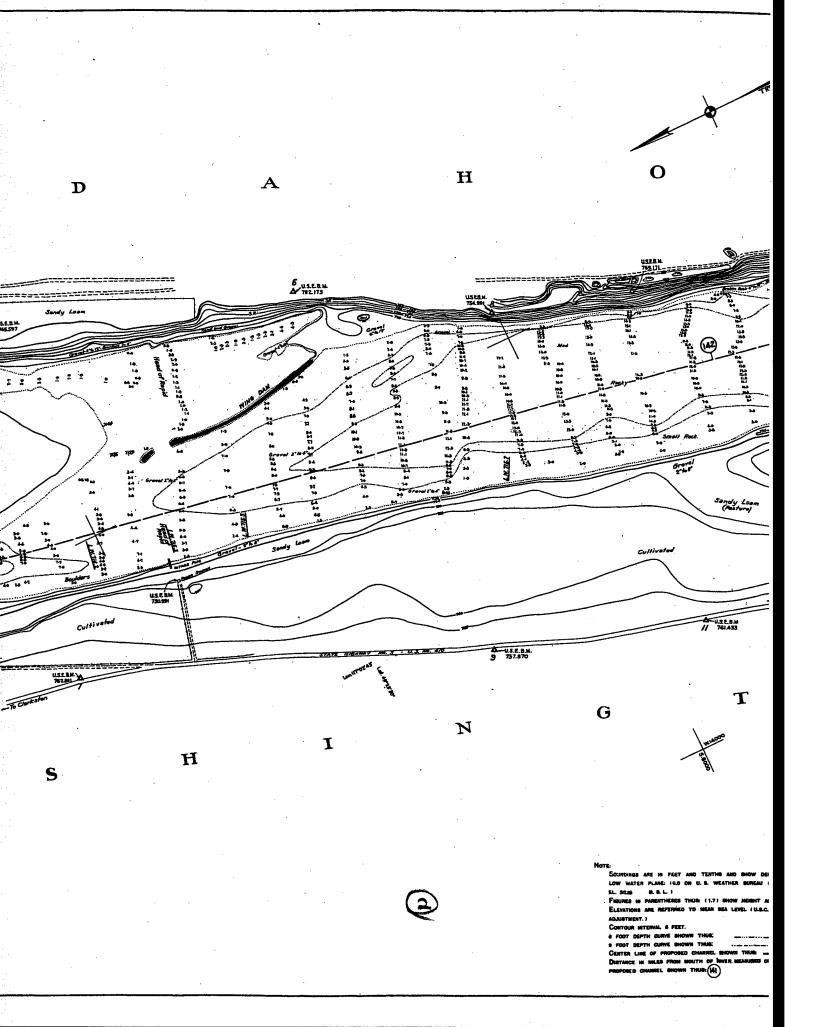


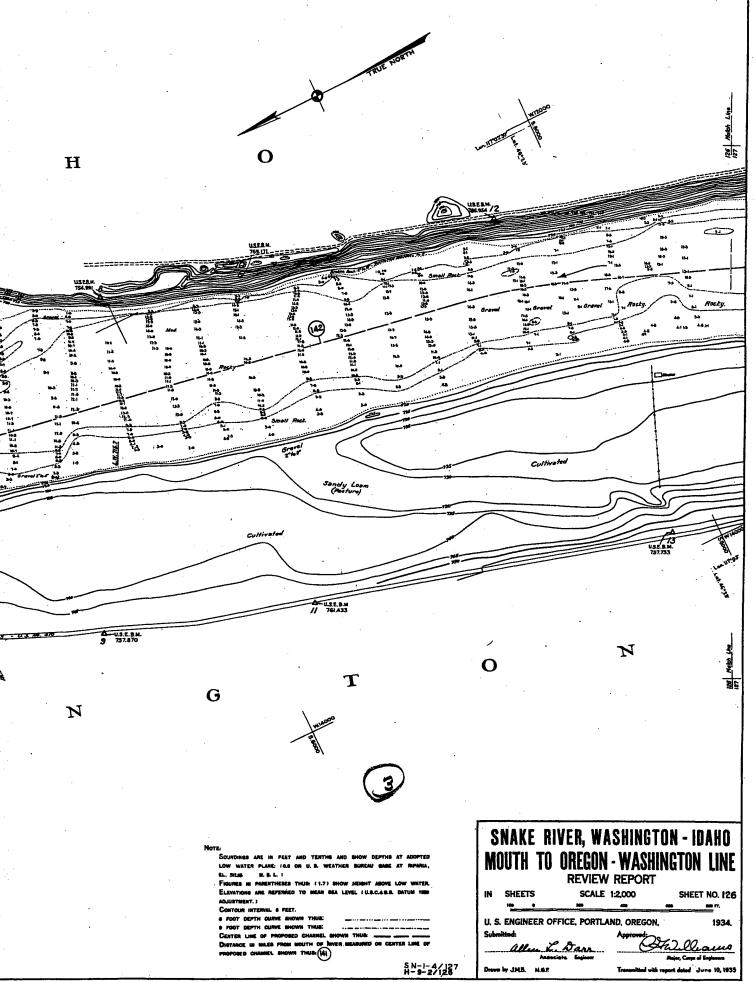


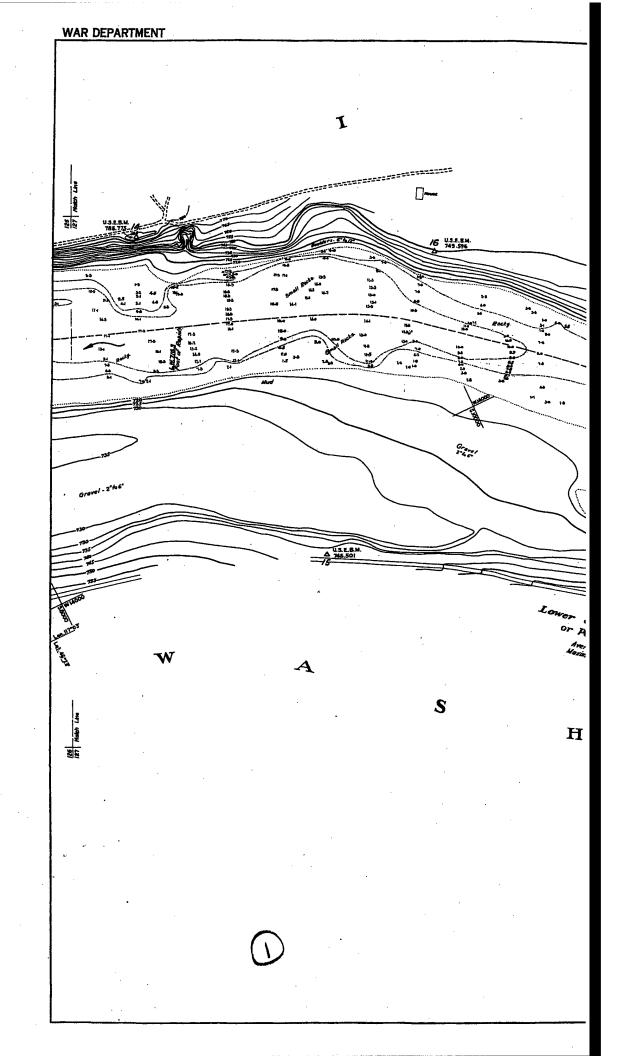


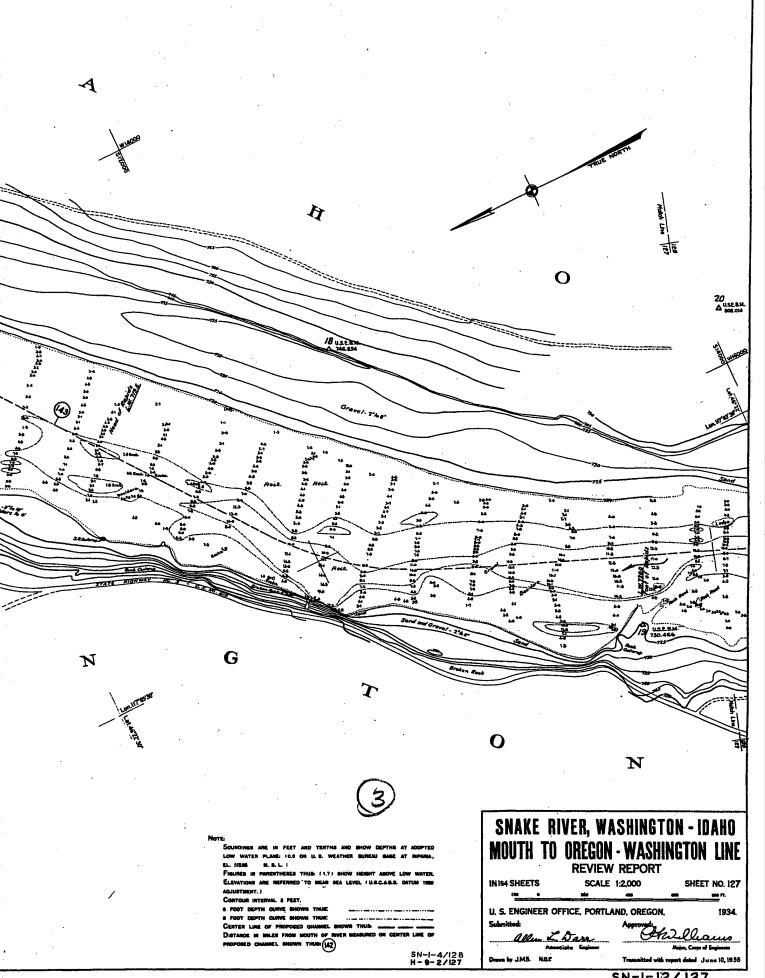


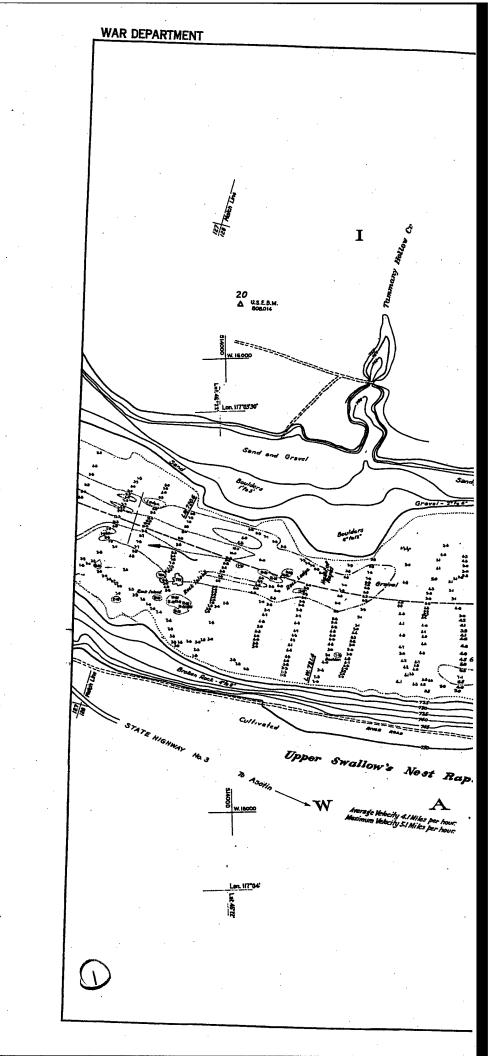


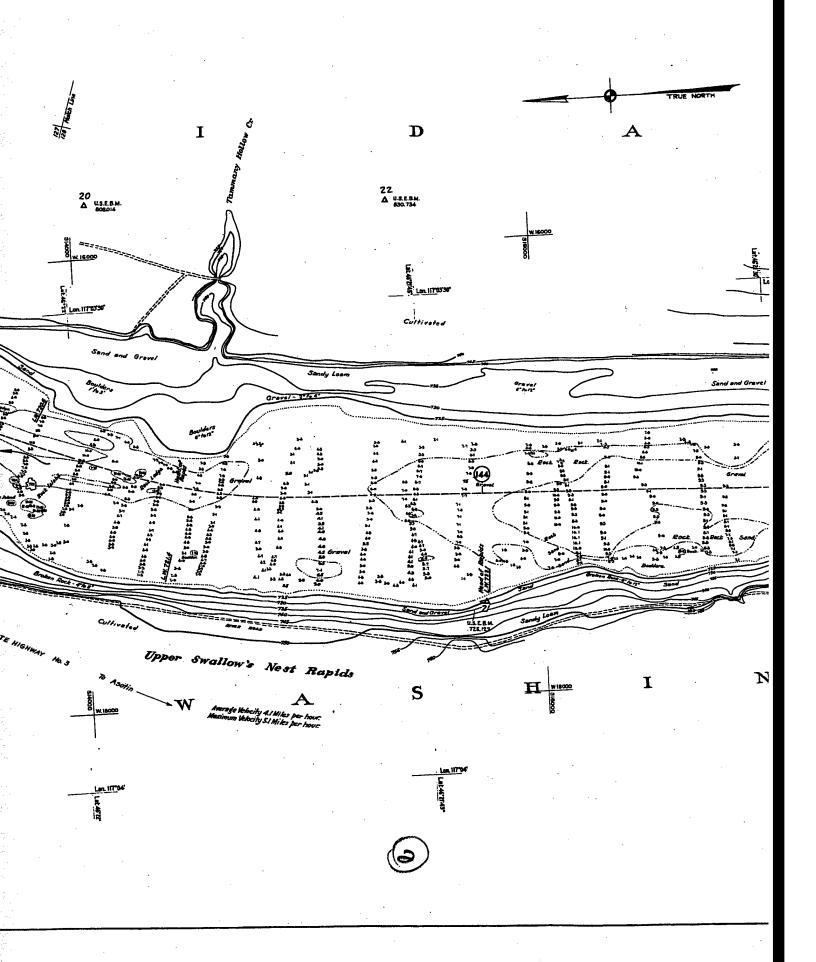


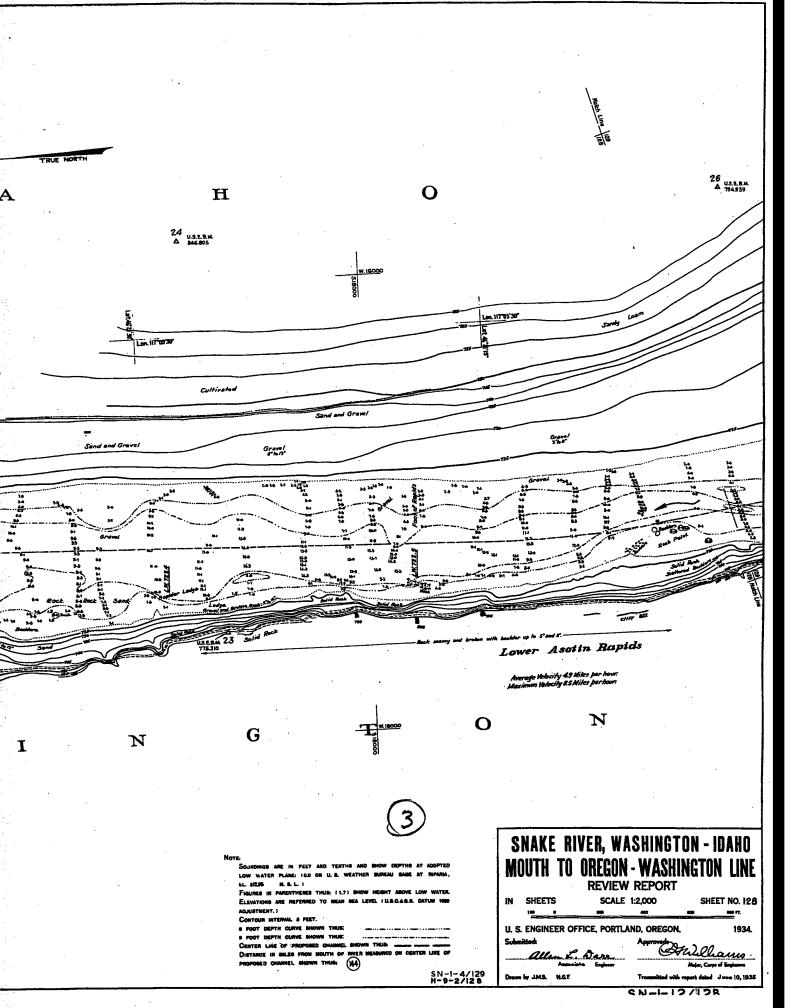


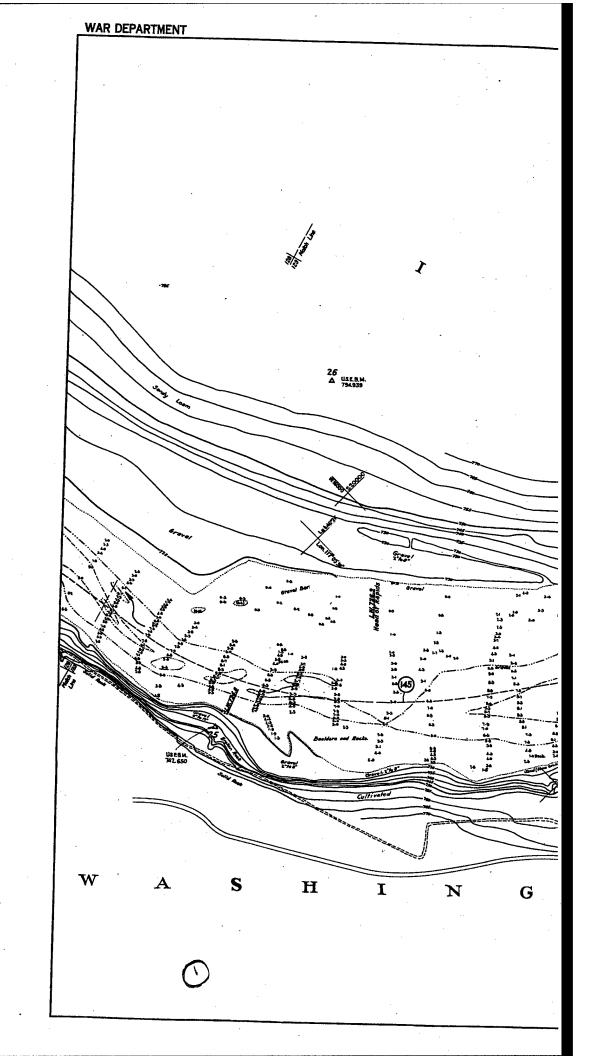


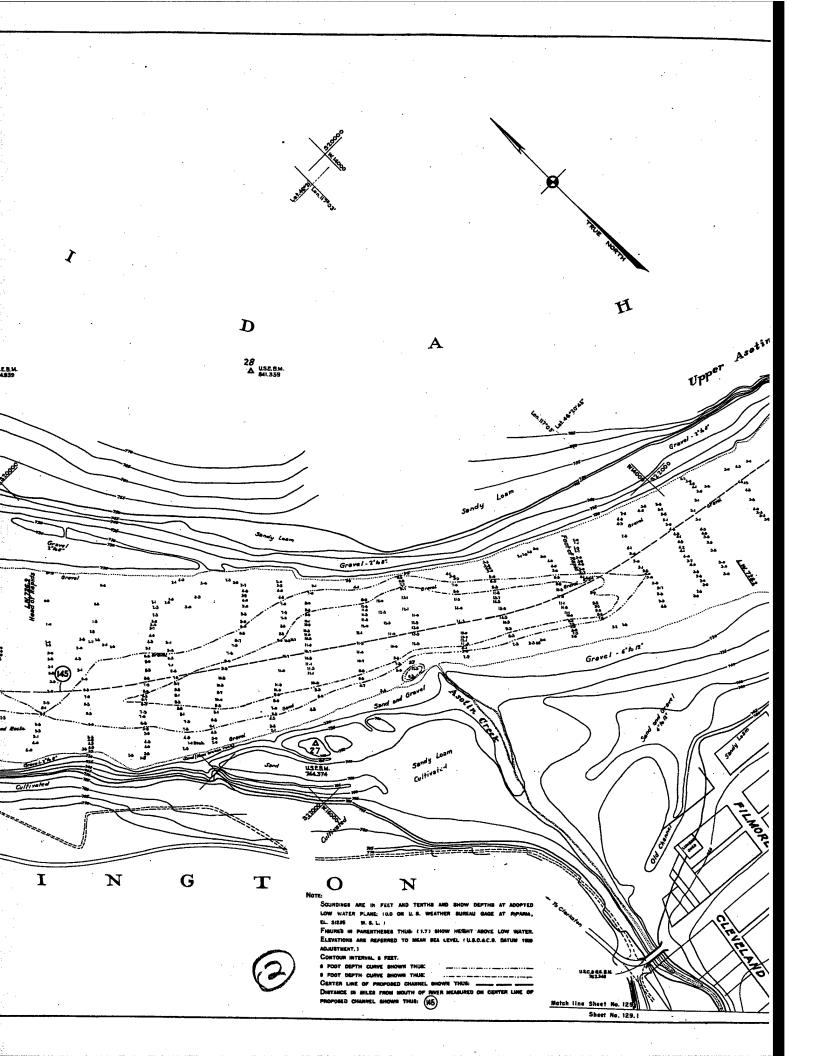


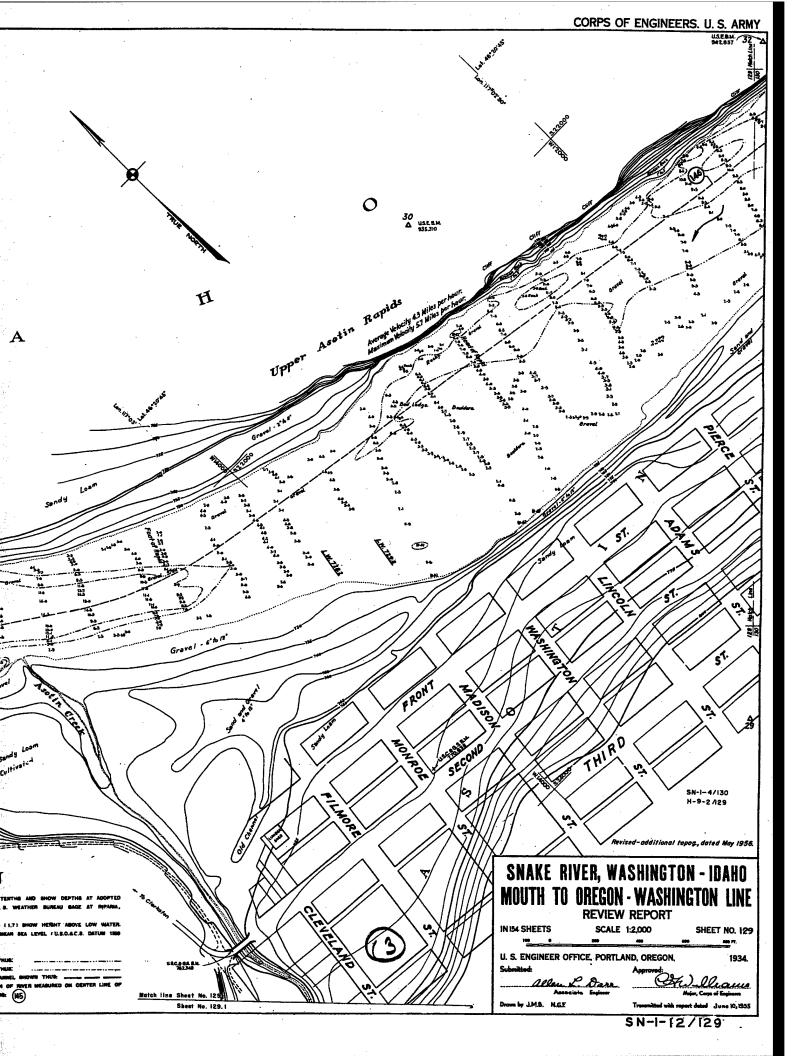


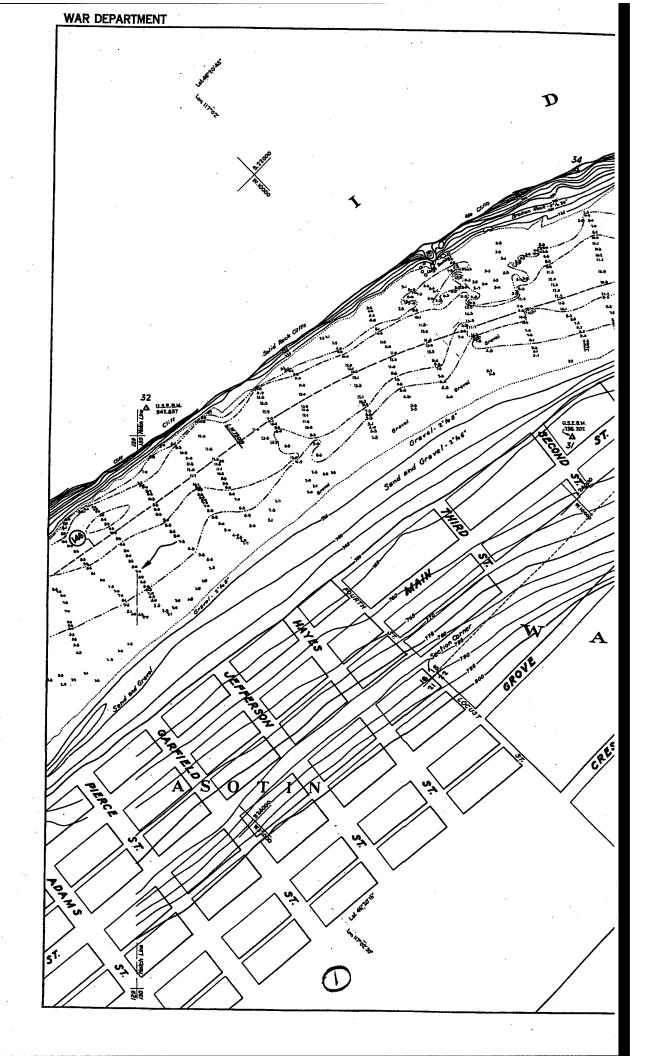


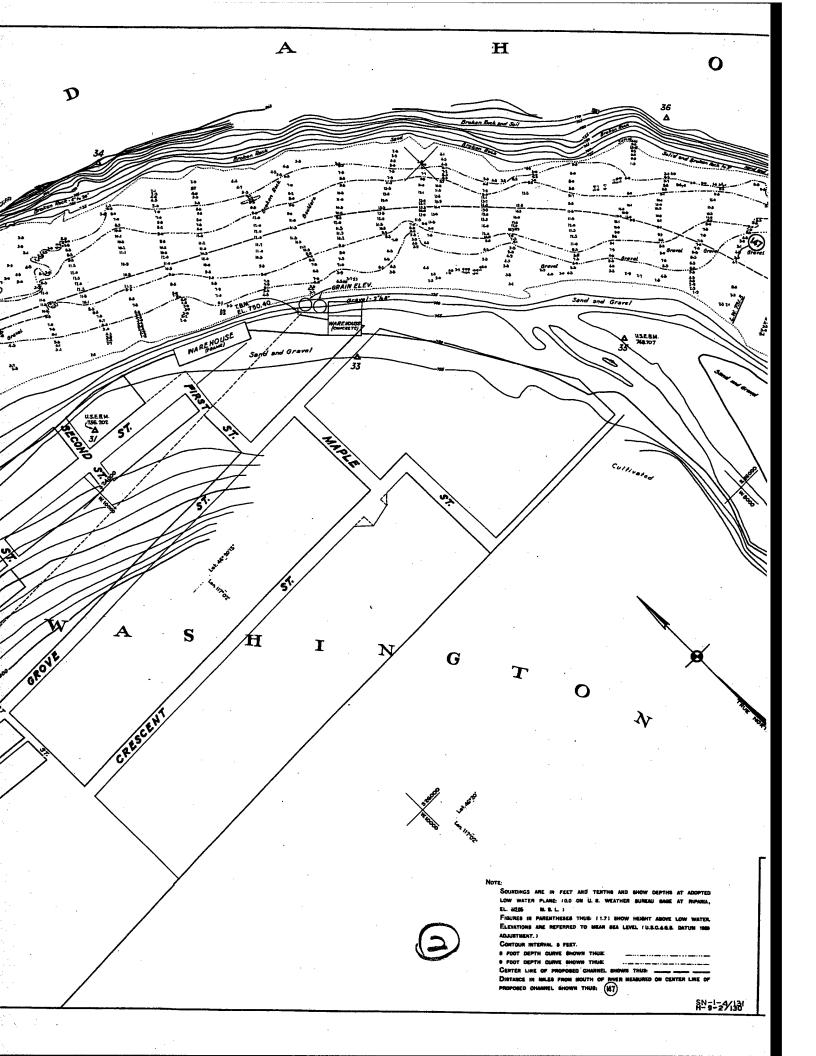


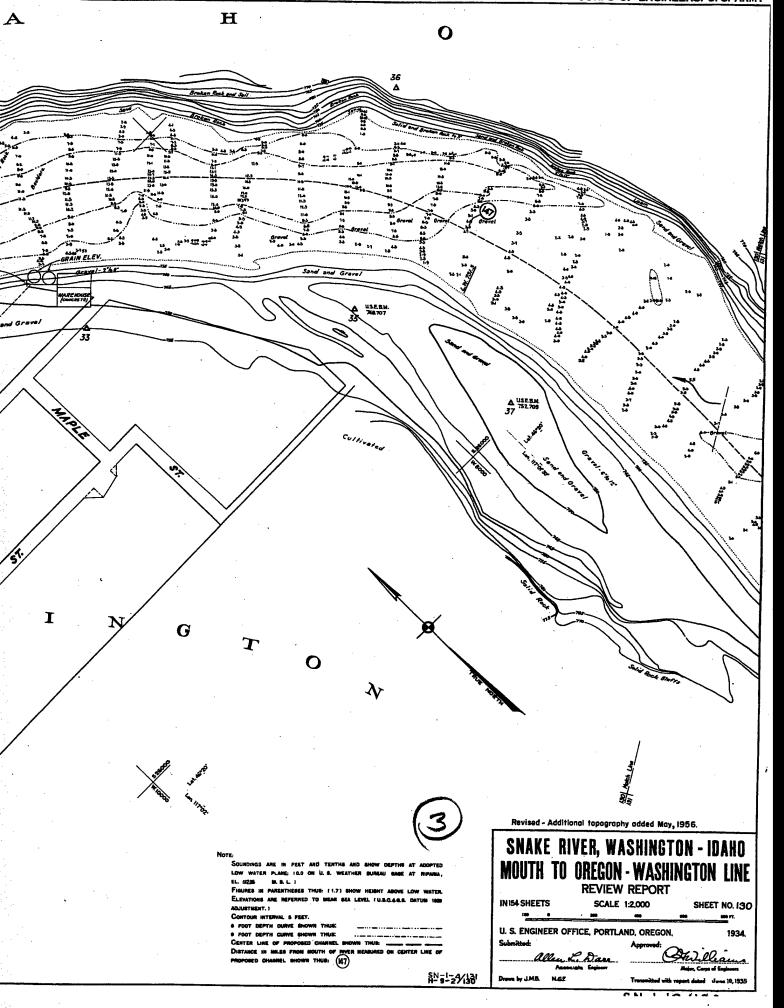


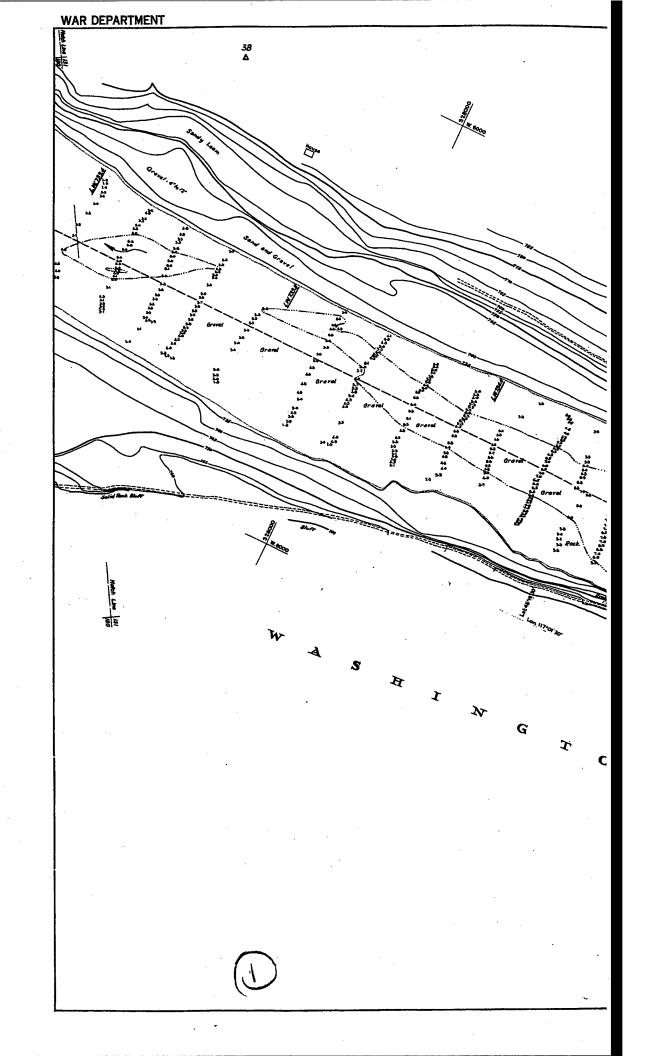


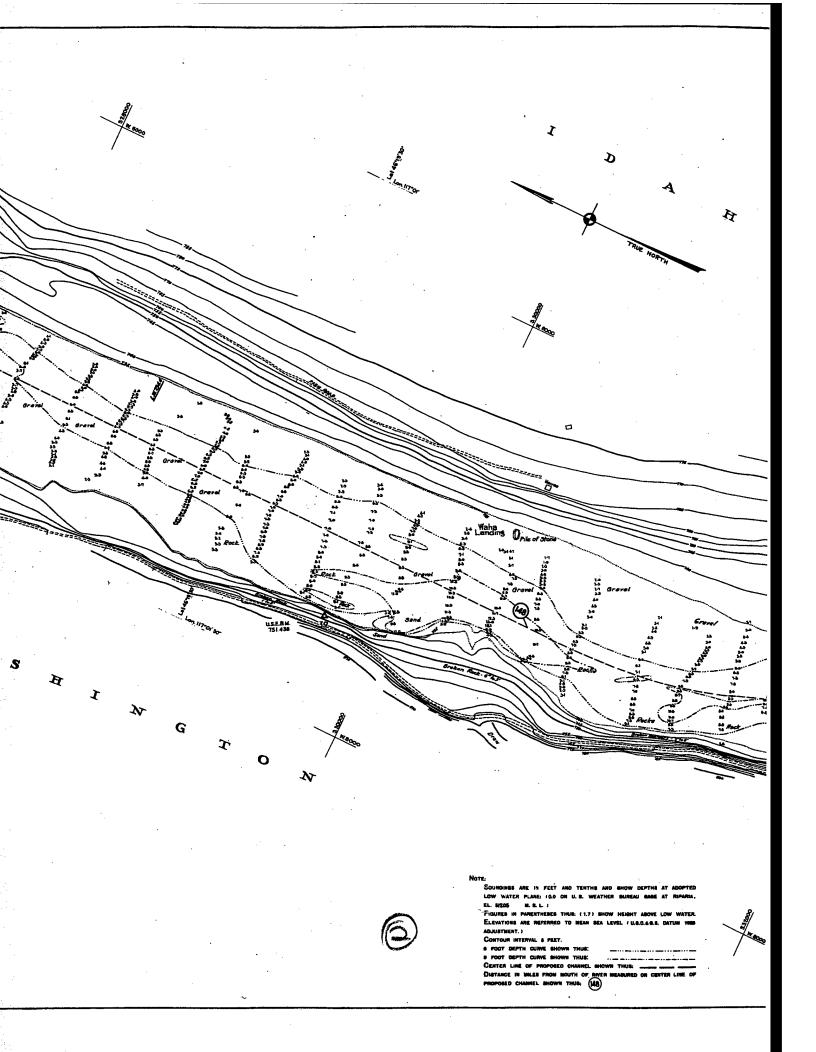


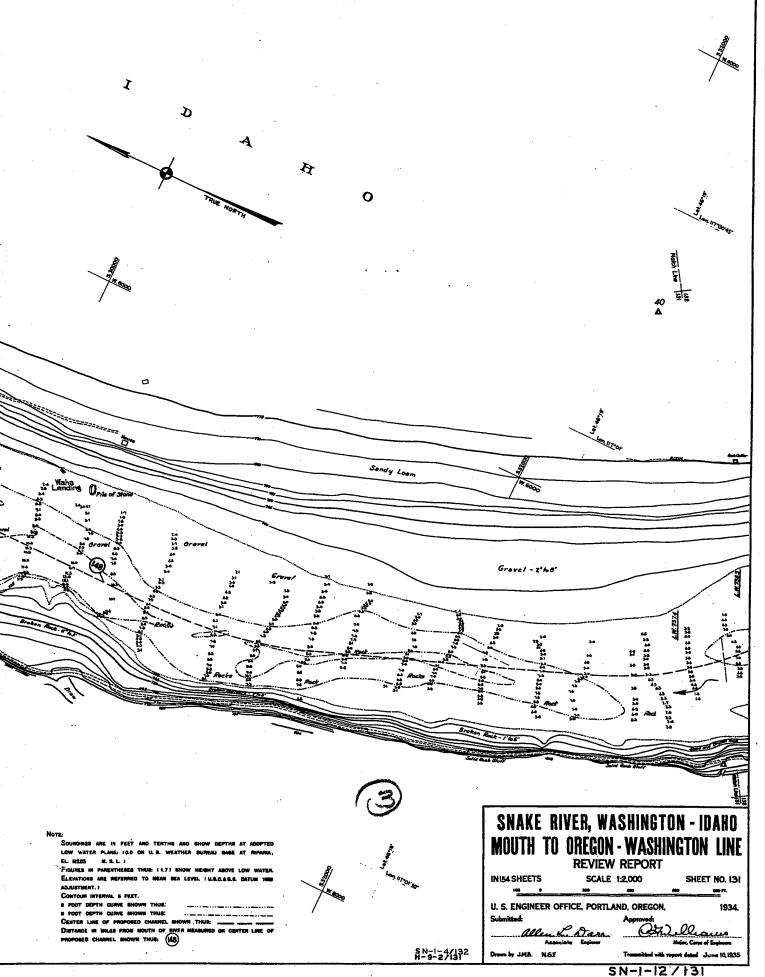












Annex B PRE- AND POST-DAM COMPARISON DISPLAYS

PROJECT	FIGURE NUMBER	PLATE NAME
Ice Harbor	1	3 Island & Levey Park Area
	2	19 Mile & Fish Hook Park Area
	3	Couch Island Area
	4	The Narrows Area
	5	Sheffler Area
	6	Windust Park Area
Lower Monumental	7	Monumental Rock Area
	8	Skookum Area
	9	Ayer Area
	10	55 Mile Area
	11	Lyons Ferry Area
	12	Tucannon River Confluence Area
	13	Riparia Area
Little Goose	14	Little Goose Dam Area
	15	Goose Island Area
	16	New York Bar Area
	17	Willow Bar Area
	18	Penawawa Area
	19	Shultz Bar Area
	20	Atwood Area
	21	Almota Area
Lower Granite	22	Lower Granite Dam Area



1958 aerial photography of 3 Island and Levey F



Photo 1. Left Bank, 3 Island area, 1958 oblique.



Photo 2. Left Bank, 3 Island ar

NOTES:

 Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.



nd and Levey Park area.

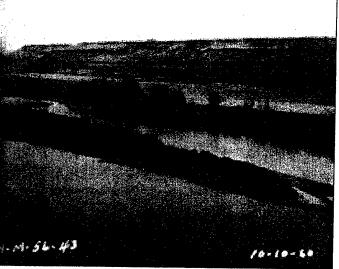


Photo 2. Left Bank, 3 Island area, 1958 oblique.

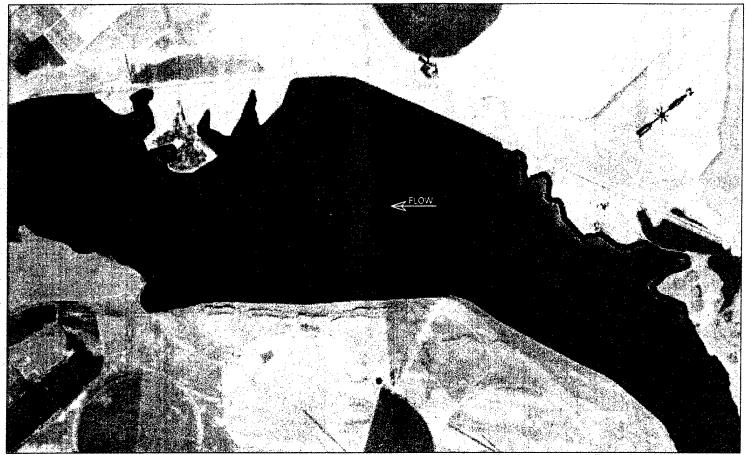


1991 aerial photography of 3 Isla



Photo 3. Left Bank, 3 Island area, 1958 oblique.





1991 aerial photography of 3 Island and Levey Park area.

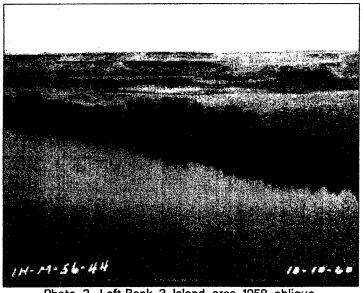
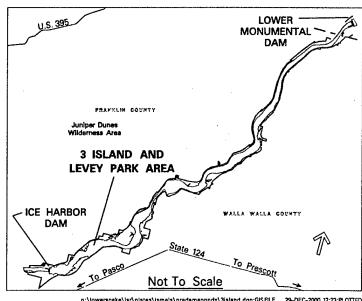


Photo 3. Left Bank, 3 Island area, 1958 oblique.



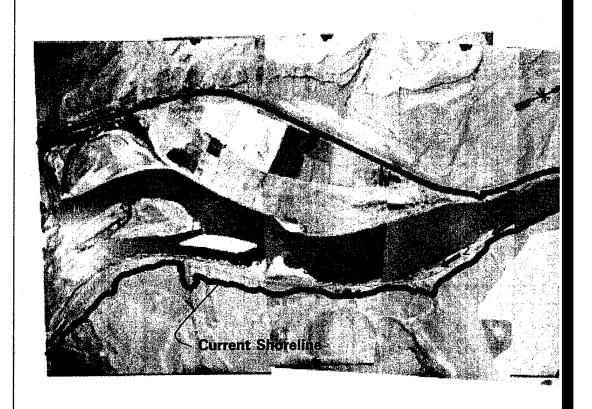
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 1.

3 ISLAND & LEVEY PARK AREA



1958 aerial photography of 19 Mile and Fish Ho

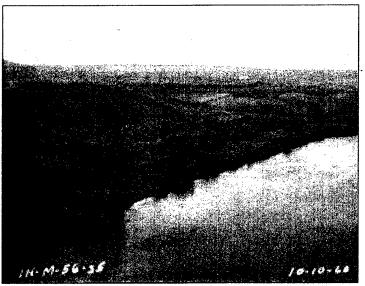


Photo 1. Left Bank, 19 Mile area, 1958 oblique.

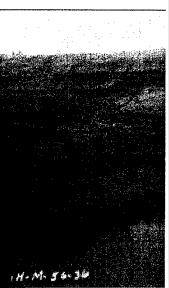
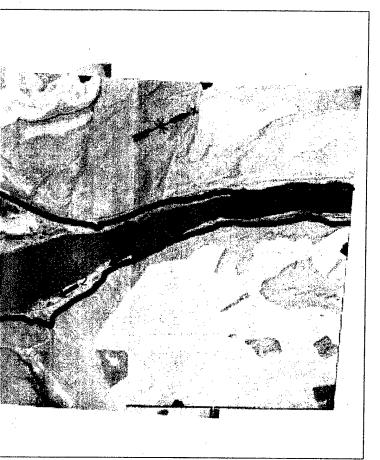


Photo 2. Left Bank, 19

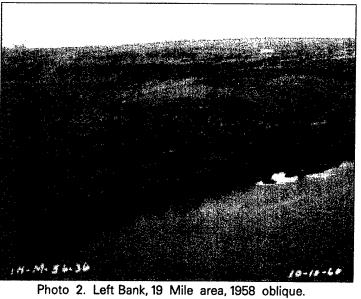
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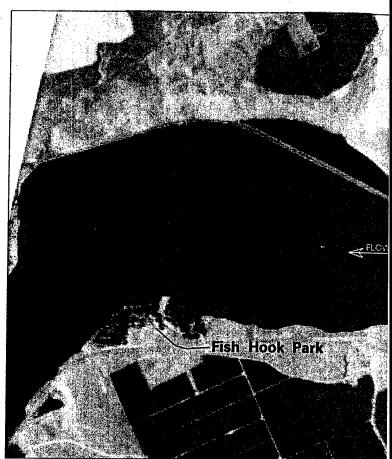
 Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.





ile and Fish Hook Park area.





1991 aerial photography of 19 M

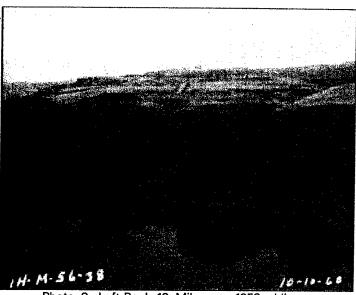


Photo 3. Left Bank, 19 Mile area, 1958 oblique.





1991 aerial photography of 19 Mile and Fish Hook Park area.

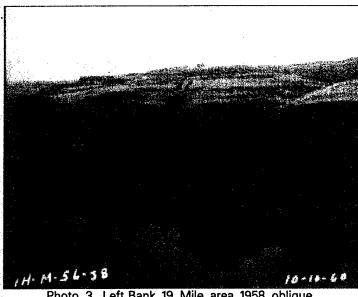
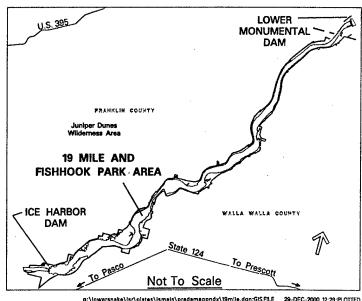


Photo 3. Left Bank, 19 Mile area, 1958 oblique.

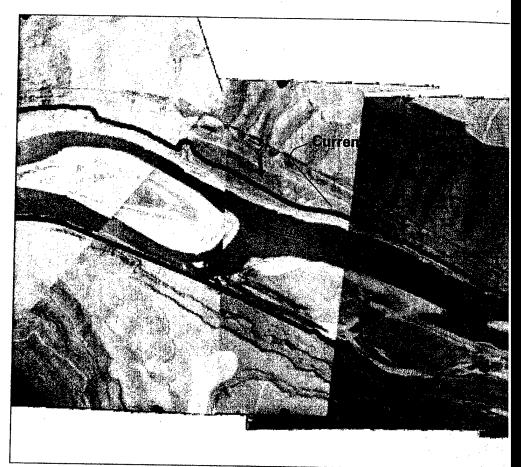




LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 2.

19 MILE & FISH HOOK PARK AREA



1958 aerial photography of Couch Is

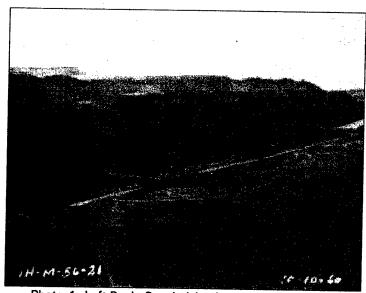


Photo 1. Left Bank, Couch Island area, 1958 oblique.

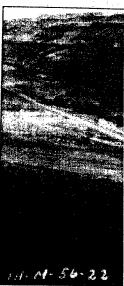
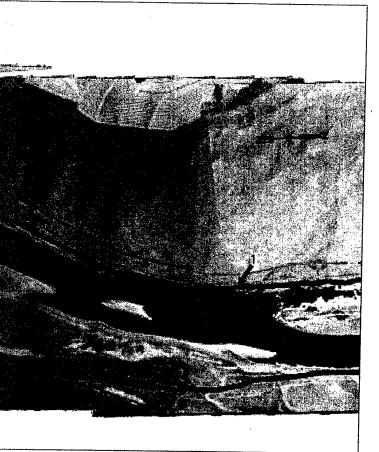


Photo 2. Left Banl

NOTES:

 Numbered arrows on 1958 serial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.





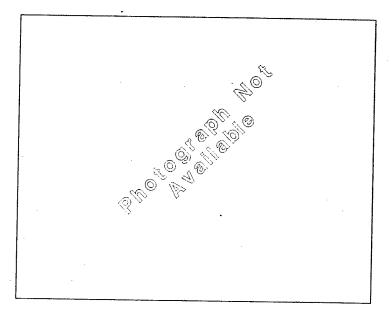
of Couch Island area.



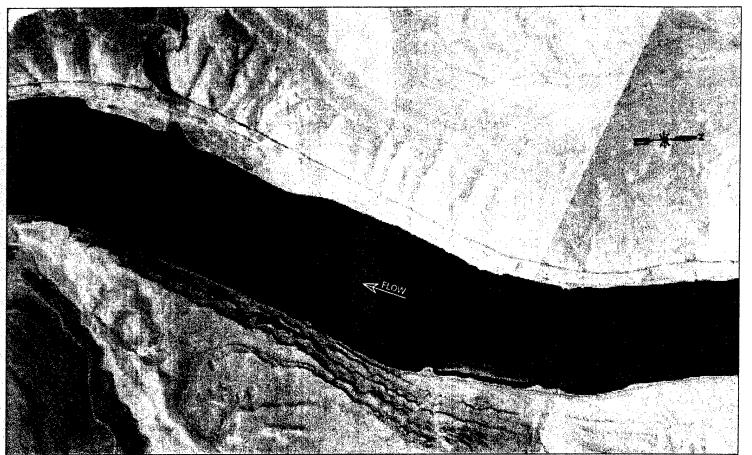
Photo 2. Left Bank, Couch Island area, 1958 oblique.



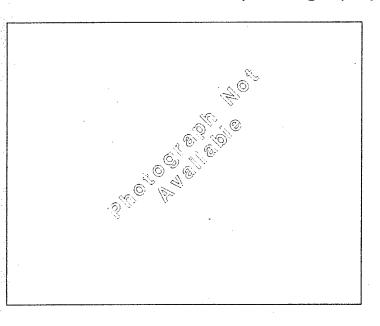
1991 aerial photography

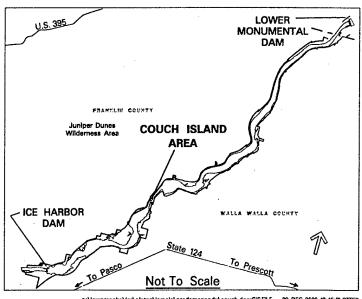






1991 aerial photography of Couch Island area.





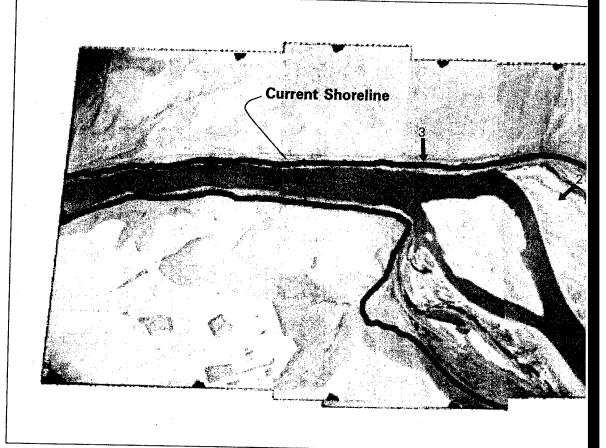
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 3. COUCH ISLAND AREA

(3)



1958 aerial photography of The Narrows ar



Photo 1. Left Bank, The Narrows area, 1958 oblique.

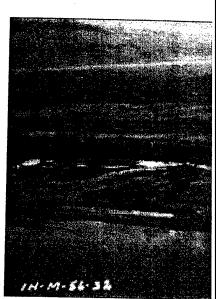
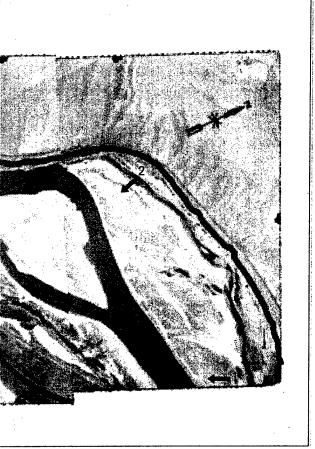


Photo 2. Left Bank, The Narrows

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e Narrows area.



2. Left Bank, The Narrows area, 1958 oblique.



1991 aerial photography of Tr

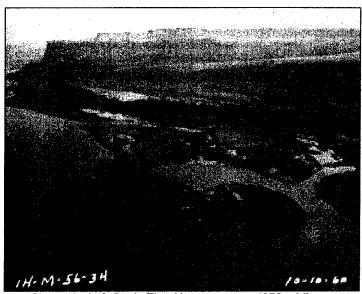
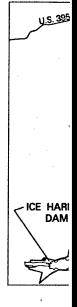
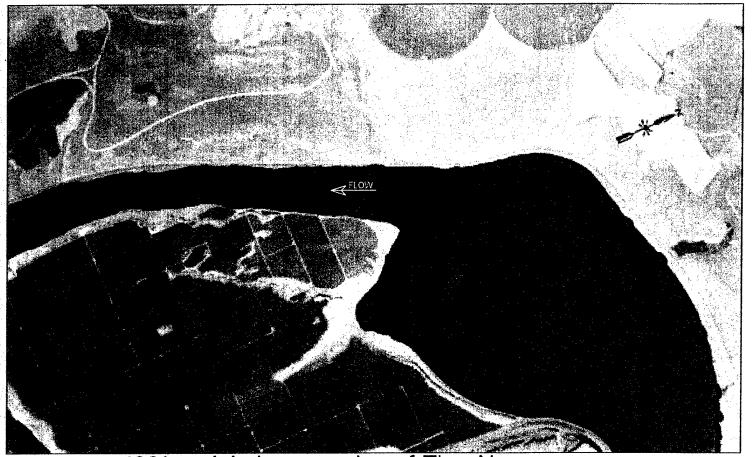


Photo 3. Left Bank, The Narrows area, 1958 oblique.

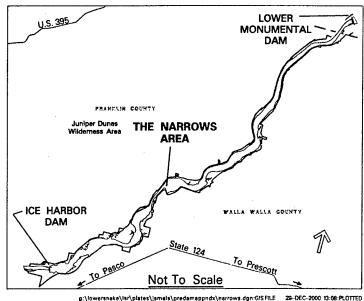




1991 aerial photography of The Narrows area.



Photo 3. Left Bank, The Narrows area, 1958 oblique.



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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study



Figure 4.

THE NARROWS AREA



1958 aerial photography of Sh

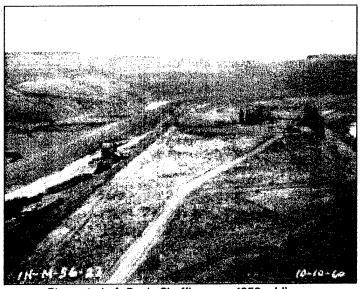
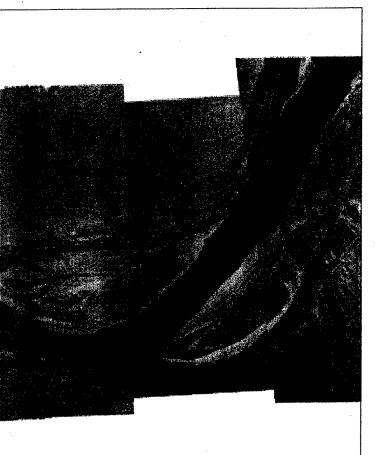


Photo 1. Left Bank, Sheffler area, 1958 oblique.



Photo





ny of Sheffler area.

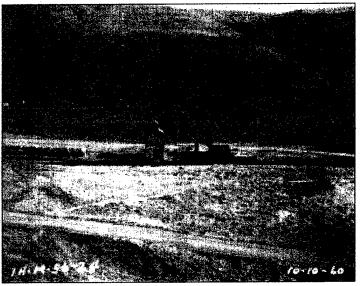
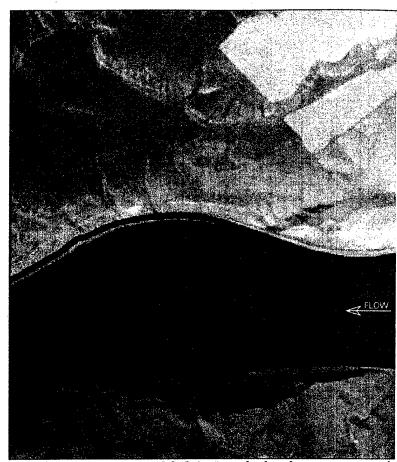


Photo 2. Left Bank, Sheffler area, 1958 oblique.



1991 aerial photograph

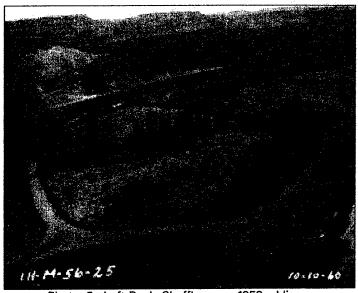
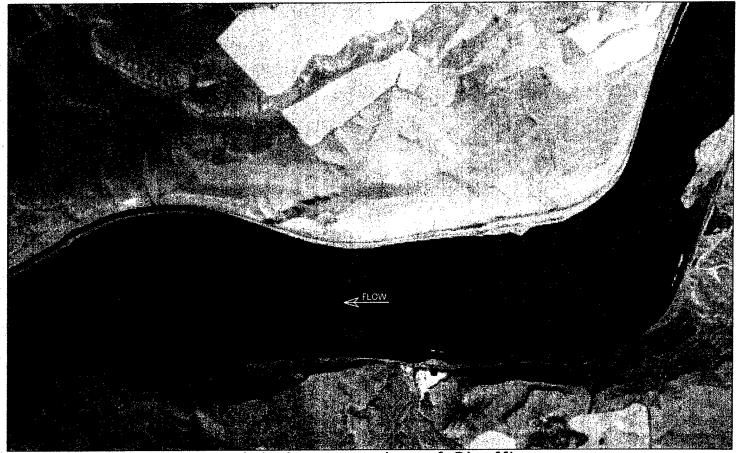


Photo 3. Left Bank, Sheffler area, 1958 oblique.



1991 aerial photography of Sheffler area.

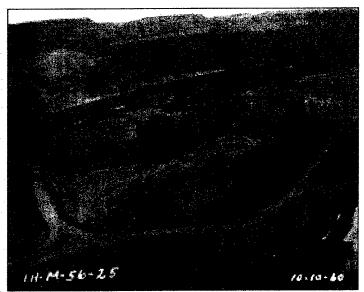
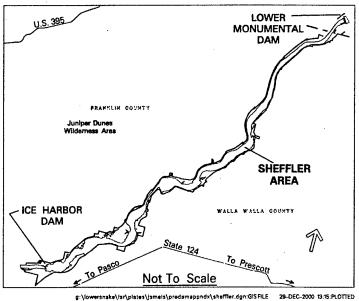


Photo 3. Left Bank, Sheffler area, 1958 oblique.

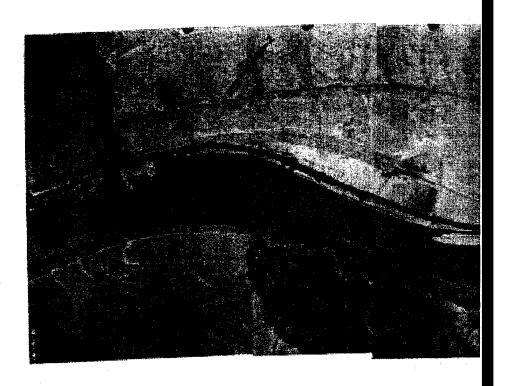




LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study



Figure 5. SHEFFLER AREA



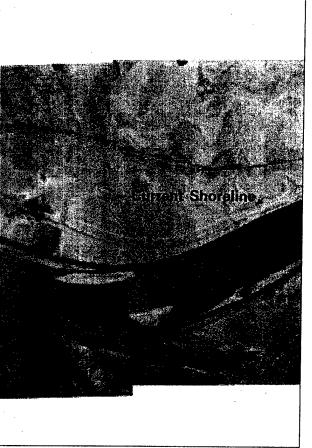
1958 aerial photography of Windust Par



Photo 1. Left Bank, Windust Park area, 1958 oblique.



Photo 2. Left Bank, Wine



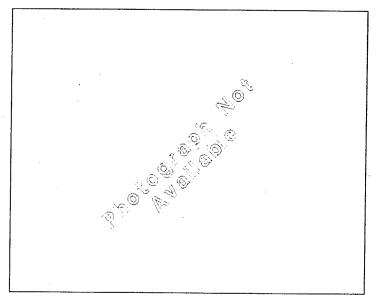
ndust Park area.



1991 aerial photography of Wi

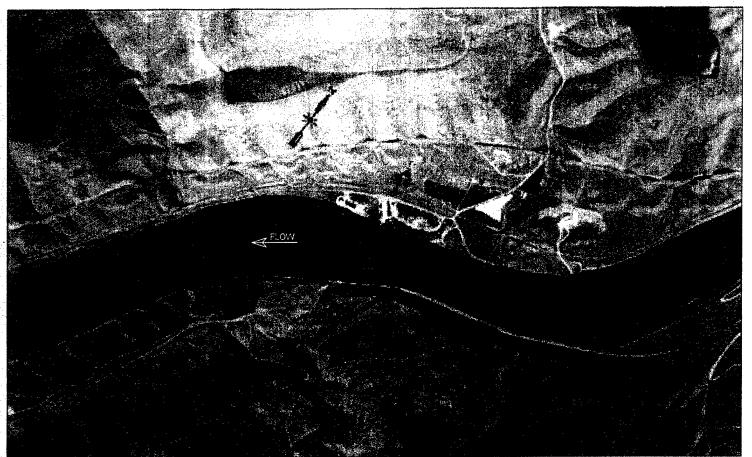


2. Left Bank, Windust Park area, 1958 oblique.

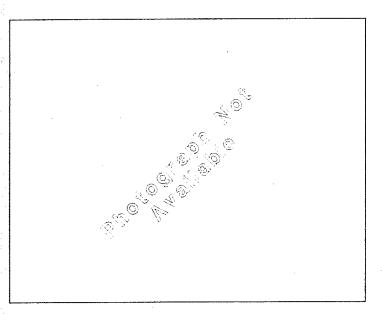








1991 aerial photography of Windust Park area.



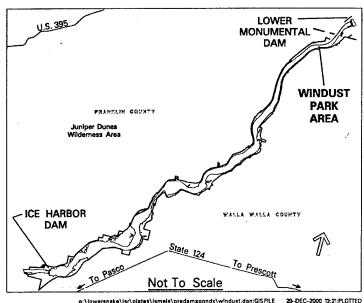
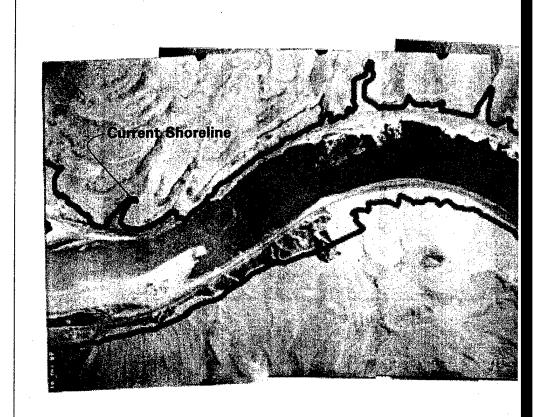


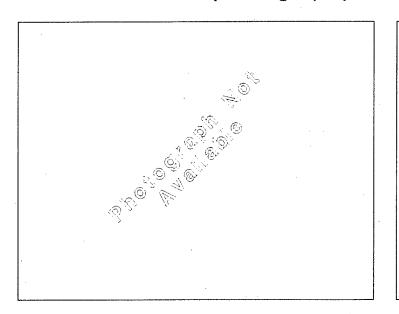


Figure 6.

WINDUST PARK AREA



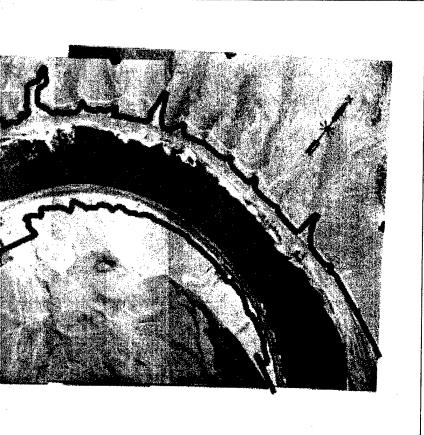
1958 aerial photography of Monumenta



() ()

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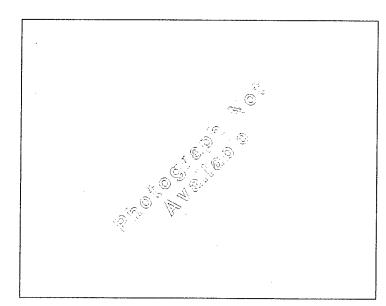


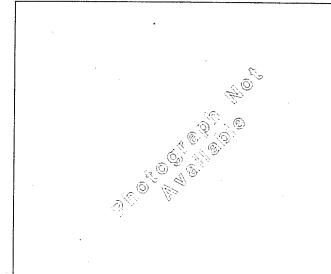


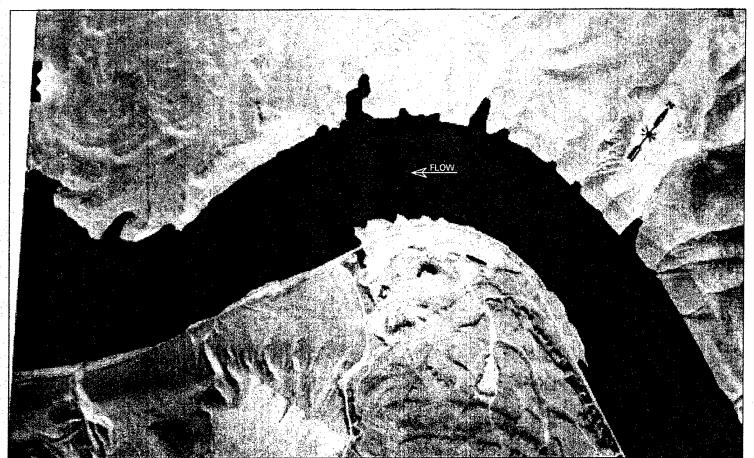
ny of Monumental Rock area.



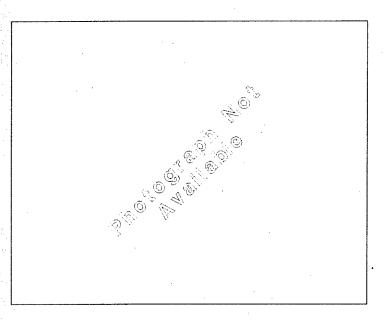
1992 aerial photograp

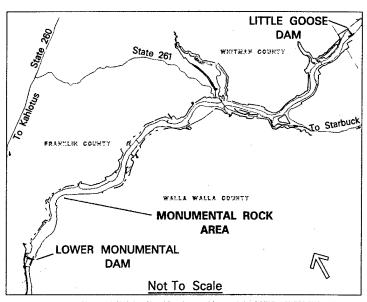






1992 aerial photography of Monumental Rock area.





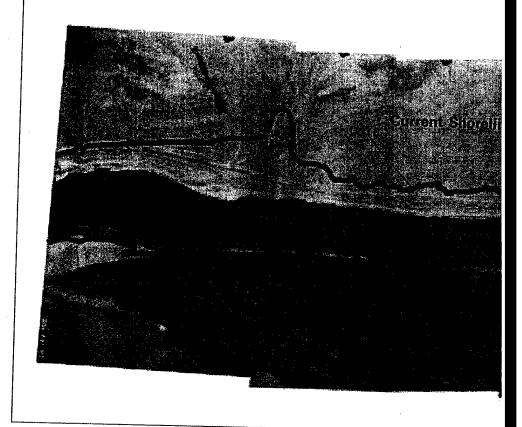
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 7.

MONUMENTAL ROCK AREA



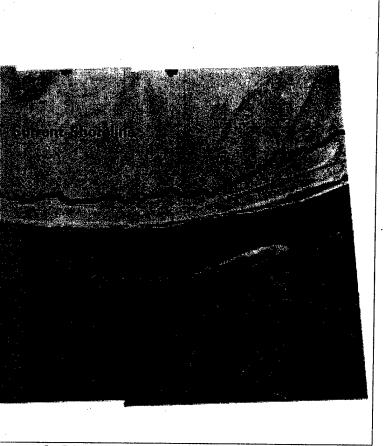
1958 aerial photography of Skooki



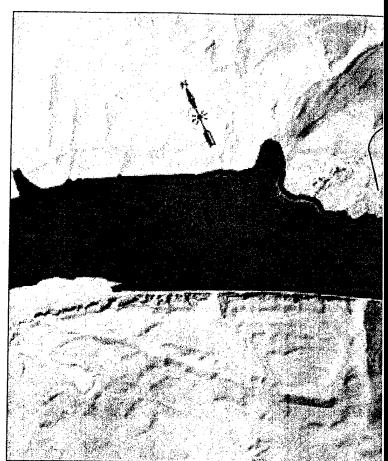
Photo 1. Right Bank, Skookum area, 1958 oblique.



Photo 2. Left B.



y of Skookum area.



1992 aerial photograph

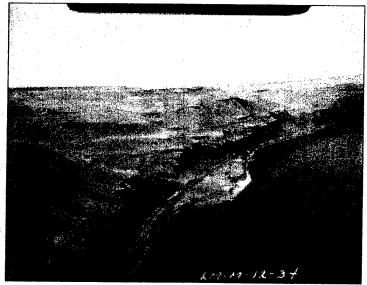


Photo 2. Left Bank, Skookum area, 1958 oblique.

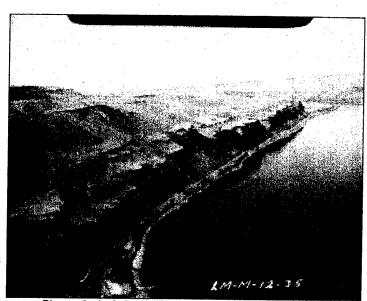
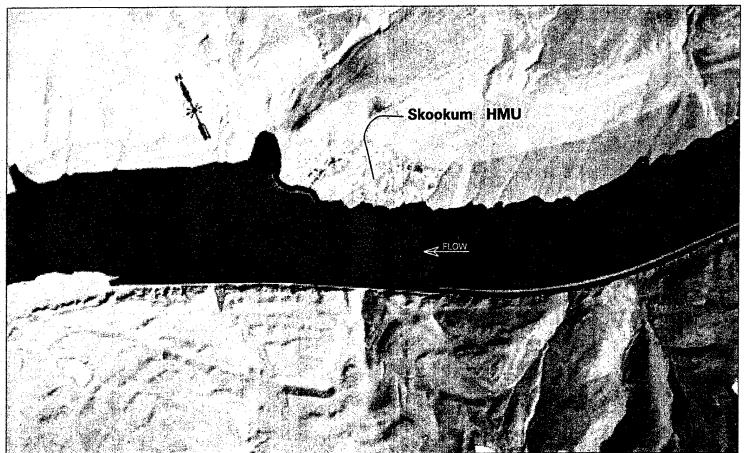


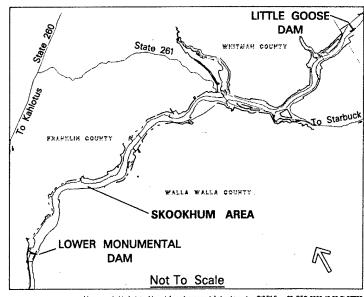
Photo 3. Left Bank, Skookum area, 1958 oblique.



1992 aerial photography of Skookum area.



Photo 3. Left Bank, Skookum area, 1958 oblique.



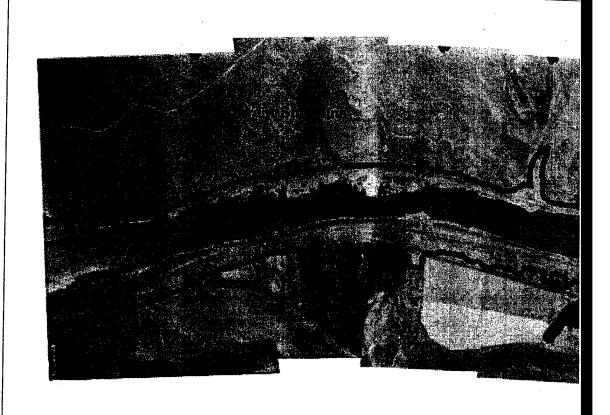
g:\lowersnake\lsr\piates\jsmeis\predamappndx\skookum.dgn:GiSFiLE 29-DEC-2000 13:33:PLOTTED



LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 8.
SKOOKUM
AREA





1958 aerial photography of Ayer area.

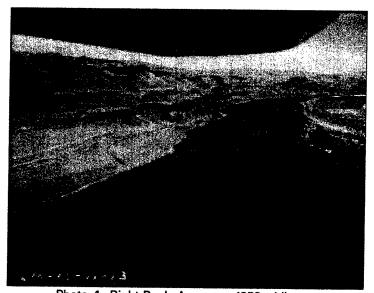


Photo 1. Right Bank, Ayer area, 1958 oblique.

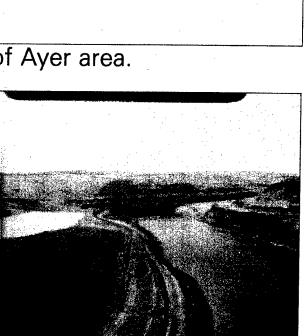


Photo 2. Left Bank, Ayer ar

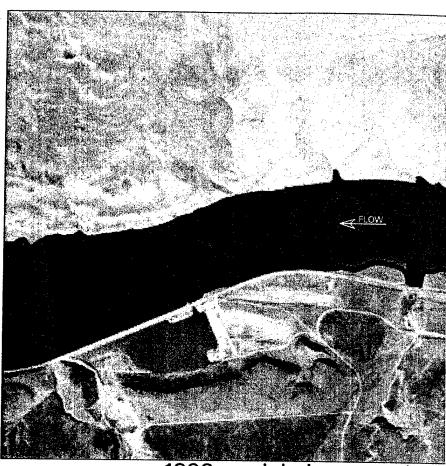
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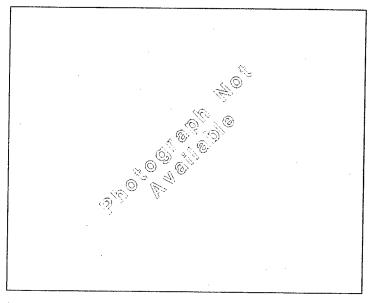




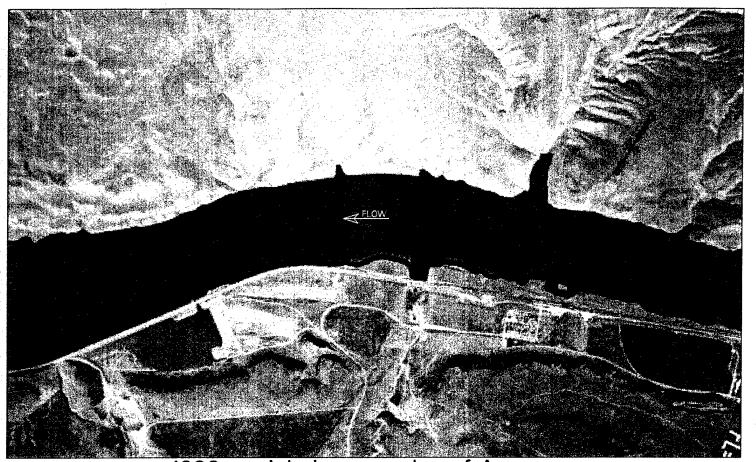
noto 2. Left Bank, Ayer area, 1958 oblique.



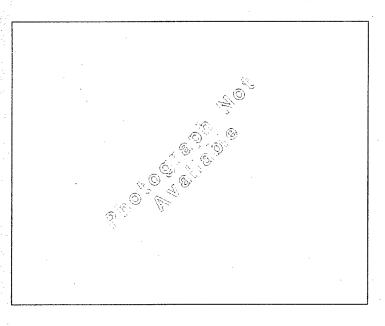
1992 aerial photography

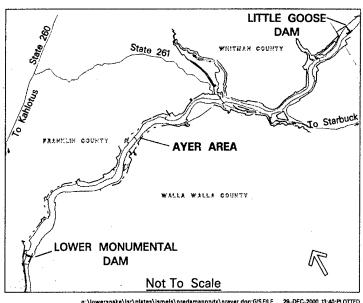






1992 aerial photography of Ayer area.





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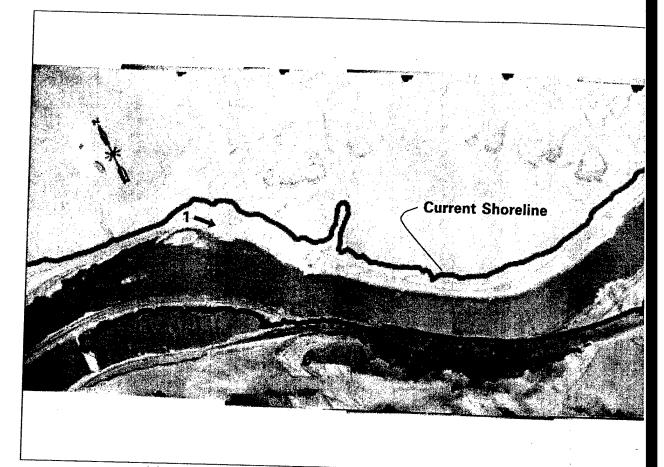
LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study



Figure 9.

AYER

AREA



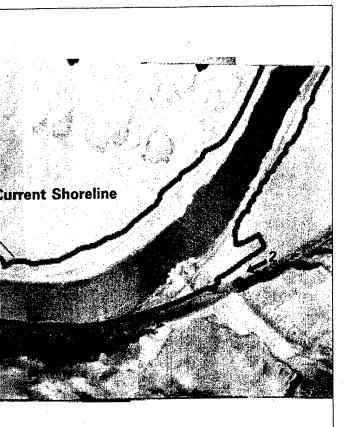
1958 aerial photography of 55 Mlle area.



Photo 1. Right Bank, 55 Mile area, 1958 oblique.



Photo 2. Left Bank, 55 Mile area, 1958



of 55 Mlle area.



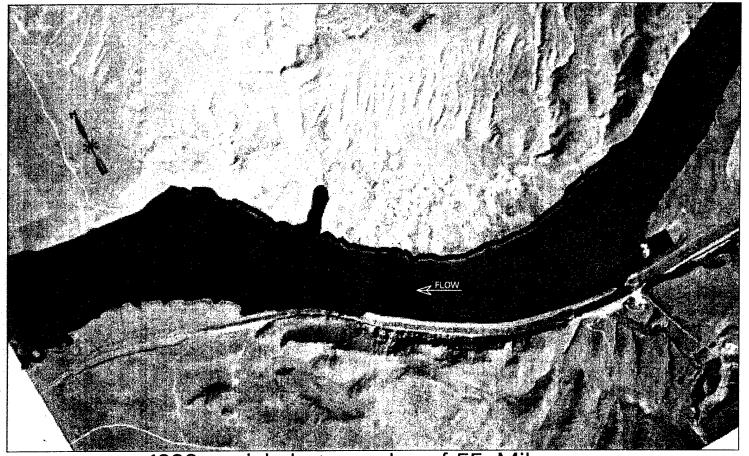
1992 aerial photography



Photo 2. Left Bank, 55 Mile area, 1958 oblique.



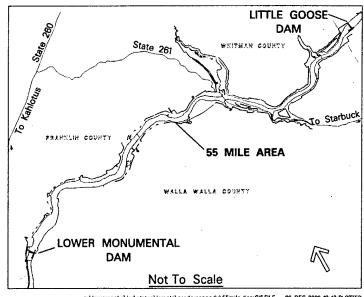




1992 aerial photography of 55 Mile area.



Photo 3. Left Bank, 55 Mile area, 1958 oblique.

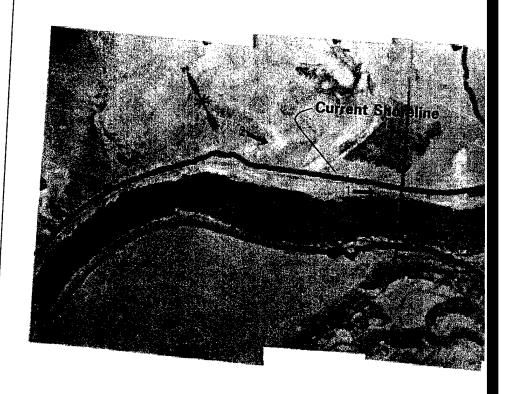


g:\lowersnake\isr\piates\jsmeis\predamappndx\55mile.dgn:GiSFILE 29-DEC-2000 13:47:PLOTTE(





Figure 10.
55 MILE AREA



1958 aerial photography of Lyon's I

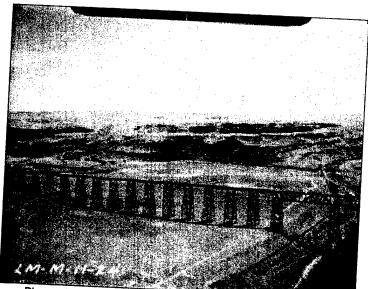


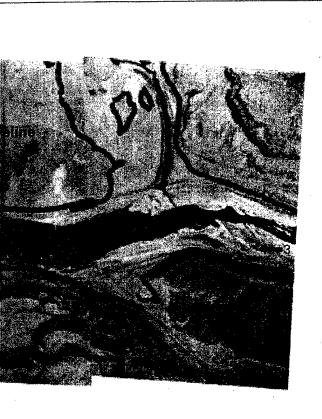
Photo 1. Right Bank, Lyon's Ferry area, 1958 oblique.



Photo 2. Right Ban

NOTES:





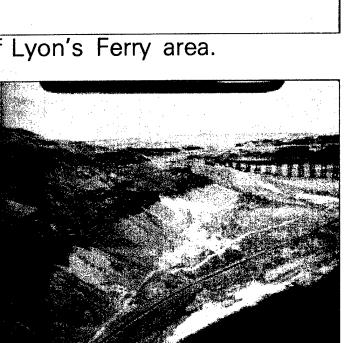
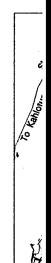


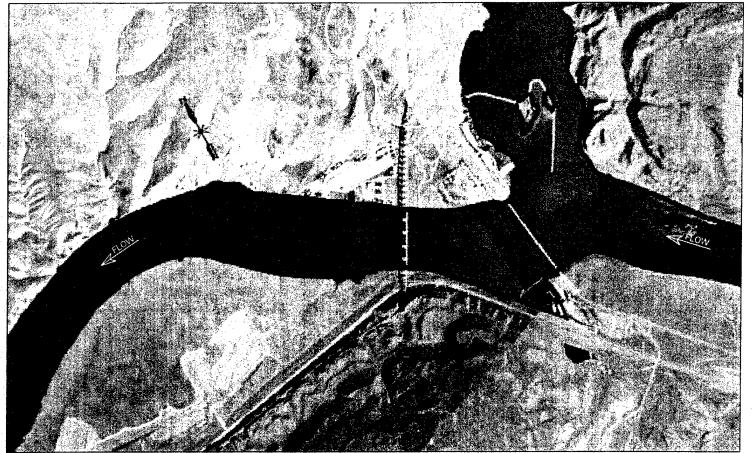
Photo 2. Right Bank, Lyon's Ferry area, 1958 oblique.



1992 aerial photography o



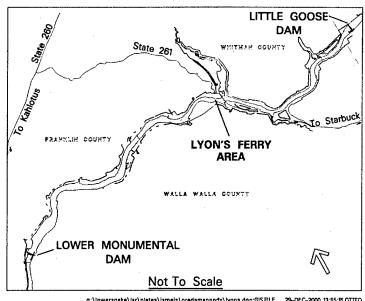




1992 aerial photography of Lyon's Ferry area.



3. Left Bank, Lyon's Ferry area, 1958 oblique.



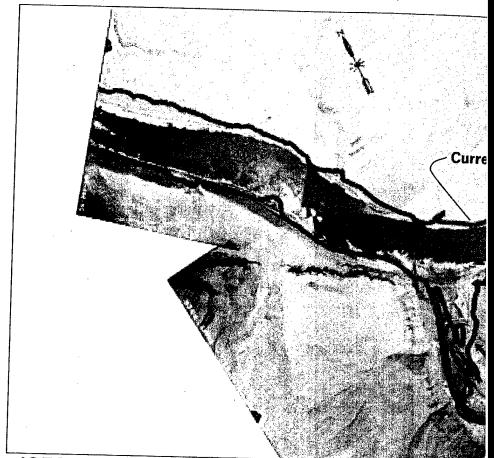
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study



Figure 11. LYON'S FERRY AREA



1958 aerial photography of Tucannon Rive



Photo 1. Left Bank, Tucannon River area, 1958 oblique.



Photo 2. Left Ba

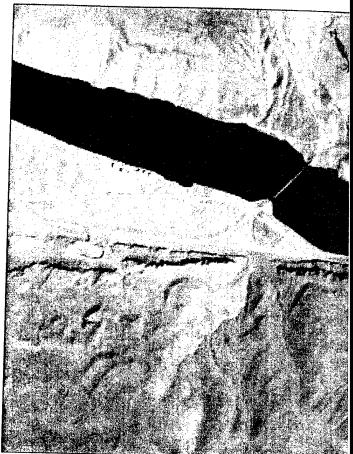




ucannon River Confluence area.



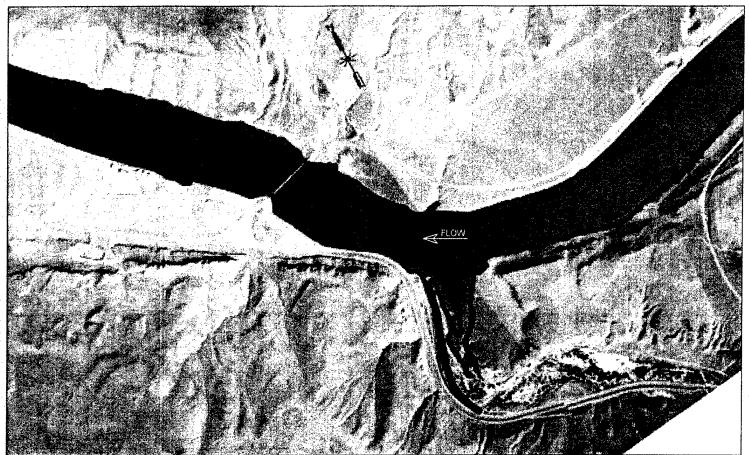
Photo 2. Left Bank, Tucannon River area, 1958 oblique.



1992 aerial photography of 7



Photo 3. Left Bank, Tucannon River area, 1958 oblique.



1992 aerial photography of Tucannon River Confluence area.



Photo 3. Left Bank, Tucannon River area, 1958 oblique.

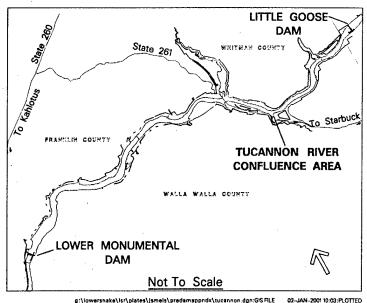




Figure 12.

TUCANNON RIVER CONFLUENCE AREA



1958 aerial photography of Riparia ¿



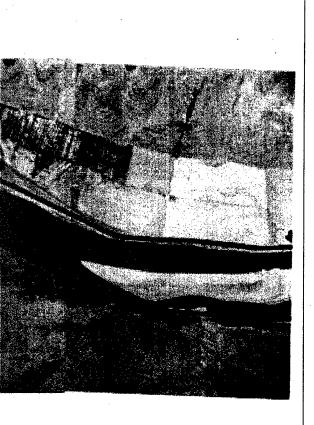
Photo 1. Right Bank, Riparia area, 1958 oblique.



Photo 2. Left Bank, F

NOTES:

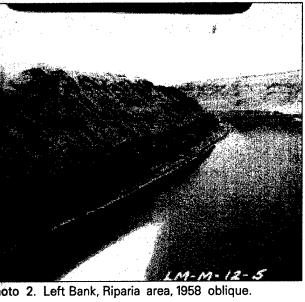


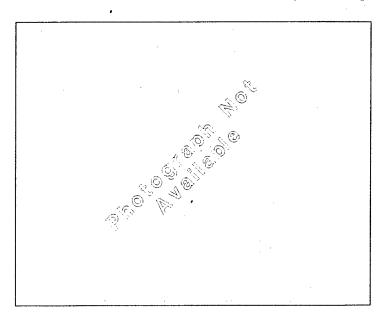


Riparia area.

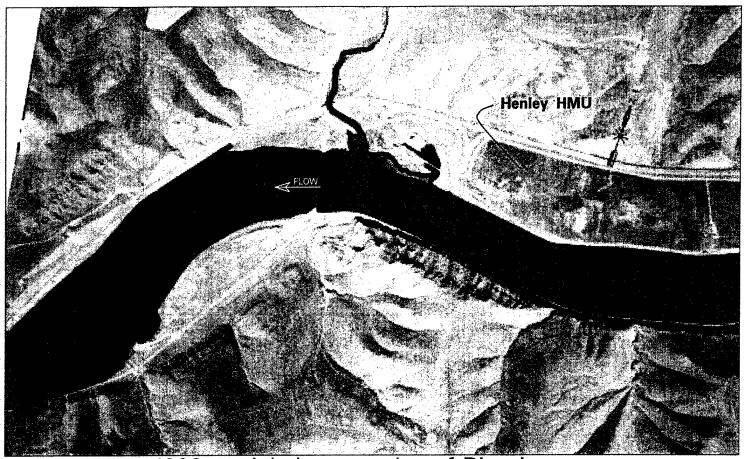


1992 aerial photography of

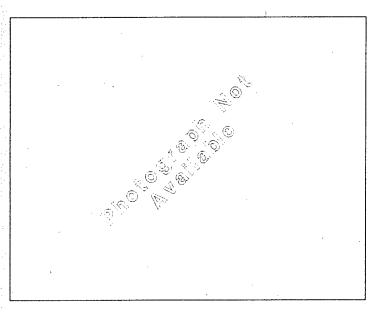








1992 aerial photography of Riparia area.



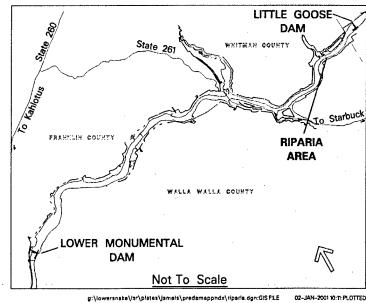
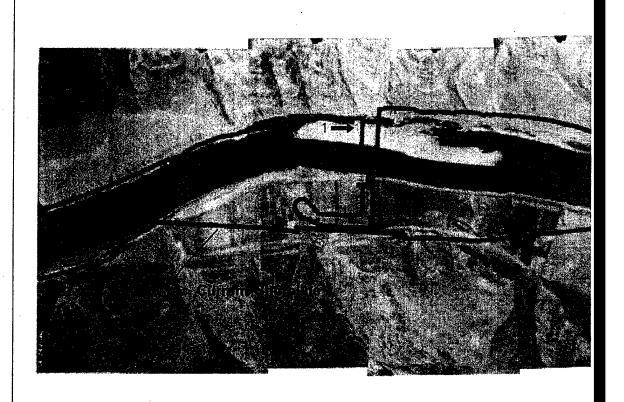




Figure 13. RIPARIA AREA



1958 aerial photography of Little Goose Dam

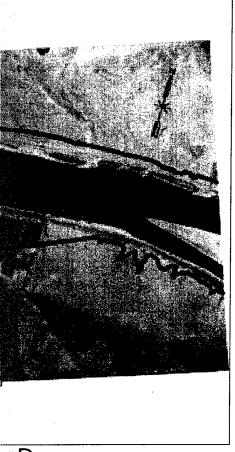


Photo 1. Right Bank, Little Goose Dam area, 1958 oblique.



Photo 2. Right Bank, Little Goose





₹E.OW

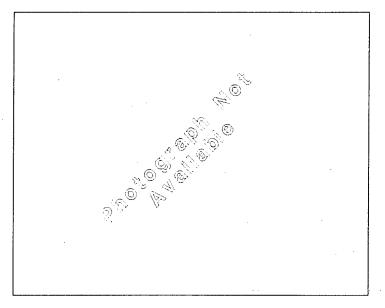
Effile Spo

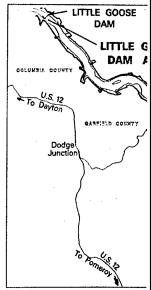
Dam area.

1992 aerial photography of Little Goose



ittle Goose Dam area, 1958 oblique.



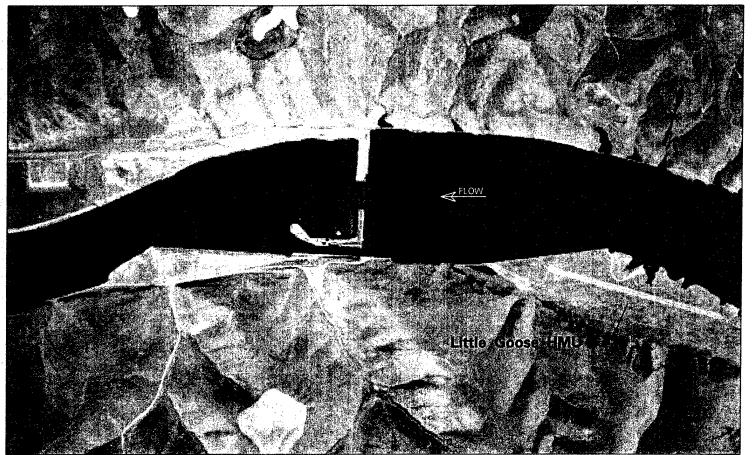


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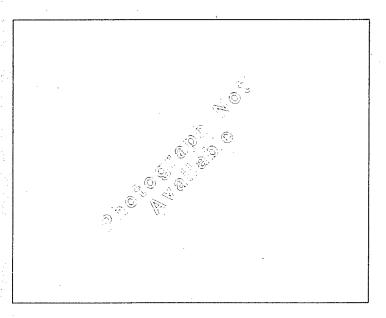


Juvenile





1992 aerial photography of Little Goose Dam area.



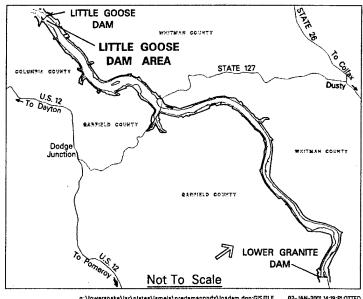




Figure 14.

LITTLE GOOSE DAM AREA





1958 aerial photography of Goose Is

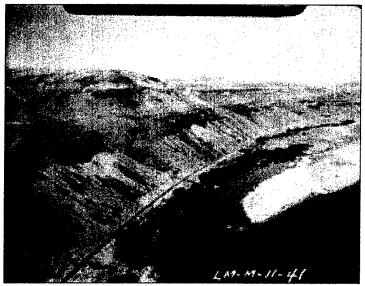


Photo 1. Right Bank, Goose Island area, 1958 oblique.



Photo 2. Right Bar



of Goose Island area.

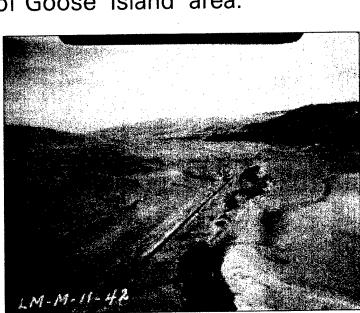
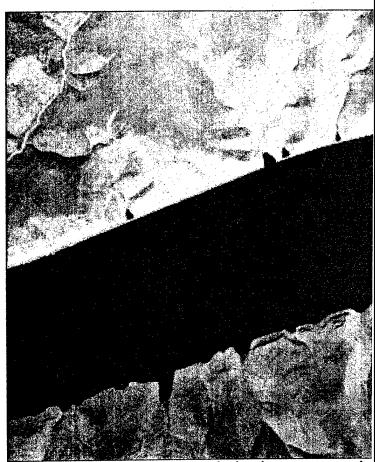


Photo 2. Right Bank, Goose Island area, 1958 oblique.



1992 aerial photograph

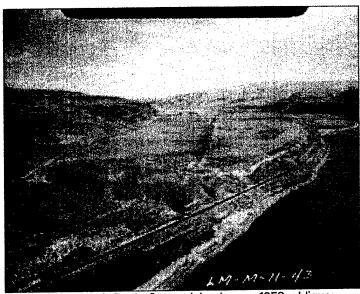
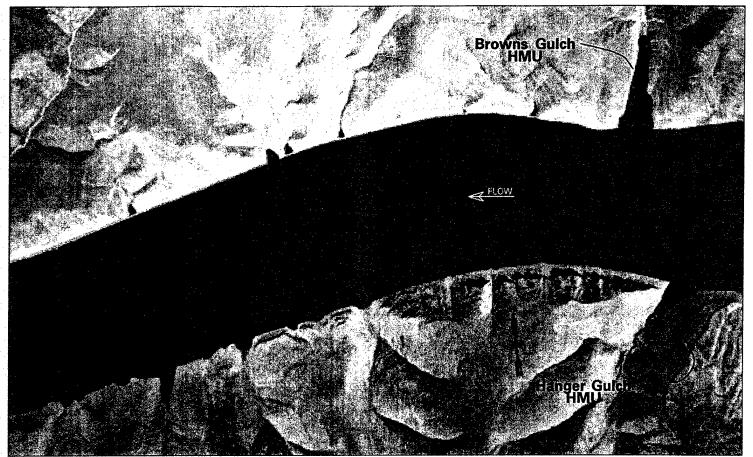


Photo 3. Left Bank, Goose Island area, 1958 oblique.





1992 aerial photography of Goose Island area.

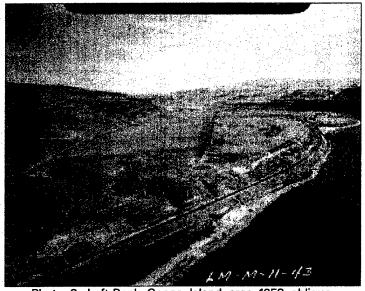
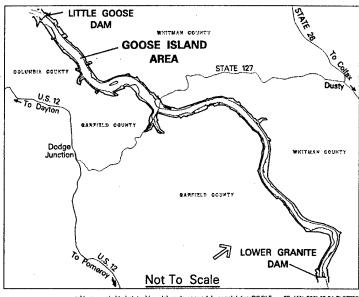


Photo 3. Left Bank, Goose Island area, 1958 oblique.

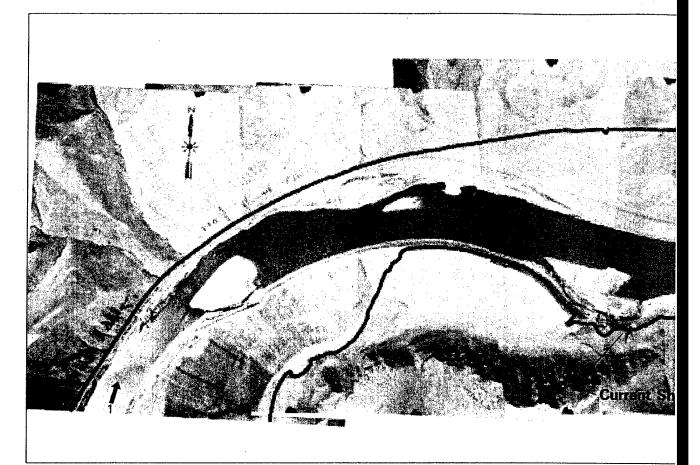


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Figure 15.

GOOSE ISLAND AREA



1958 aerial photography of New York Bar area.

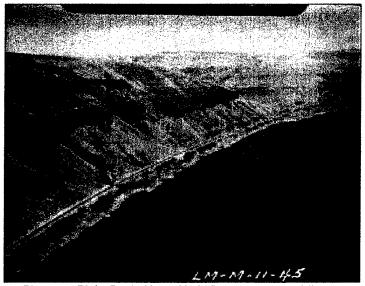


Photo 1. Right Bank, New York Bar area, 1958 oblique.

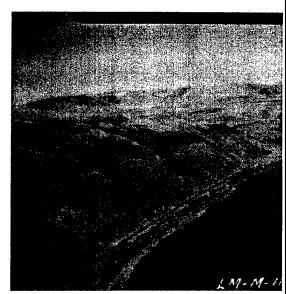
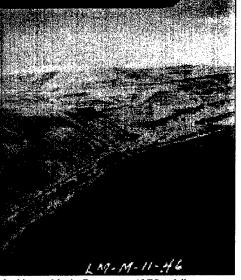


Photo 2. Right Bank, New York Bar area, 195

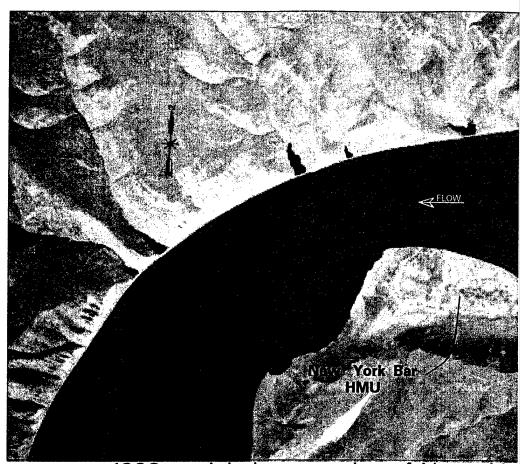




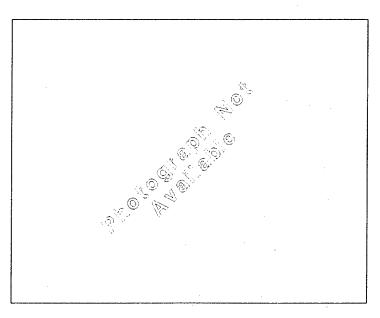
k Bar area.



nk, New York Bar area, 1958 oblique.



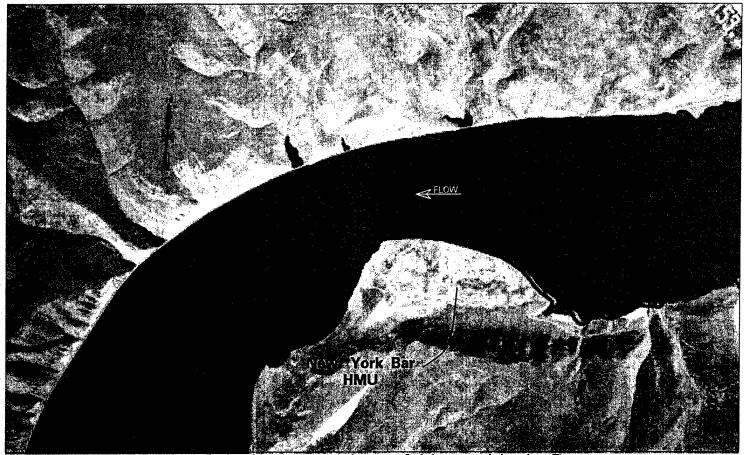
1992 aerial photography of New Yo



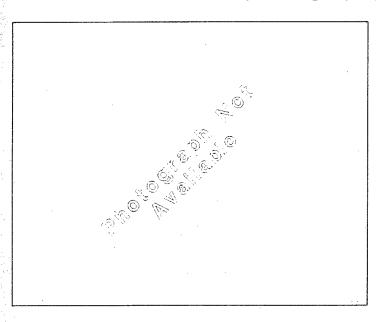


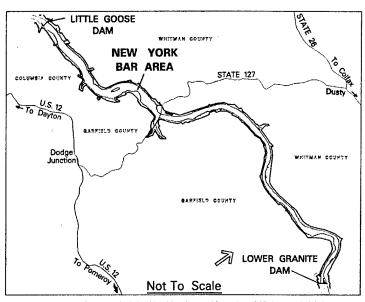
Juvenile





1992 aerial photography of New York Bar area.





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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

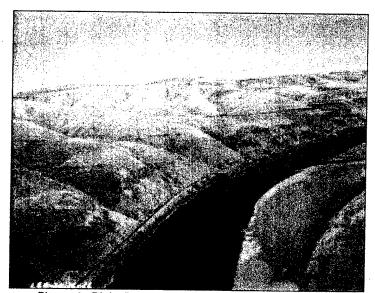


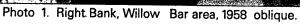
Figure 16.

NEW YORK BAR AREA



1958 aerial photography of Willow



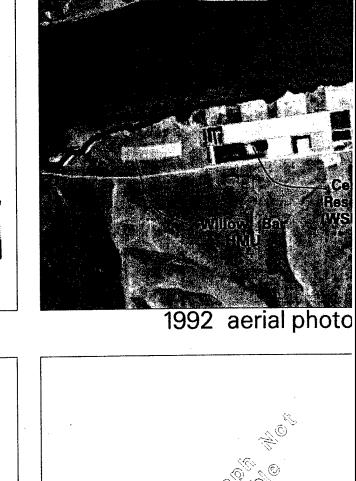


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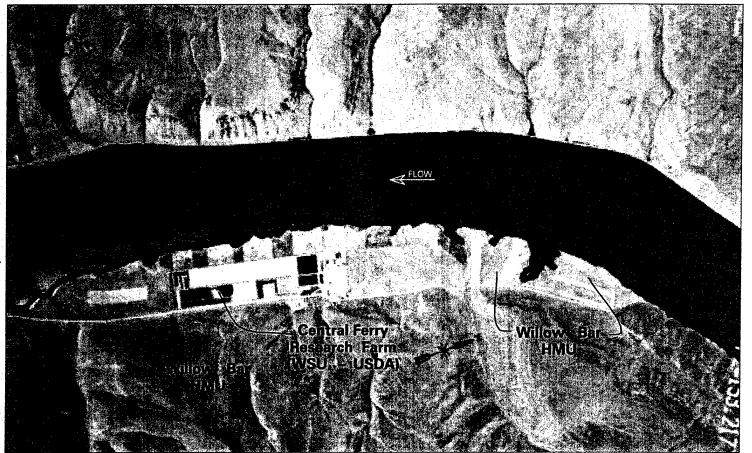


graphy of Willow Bar area.

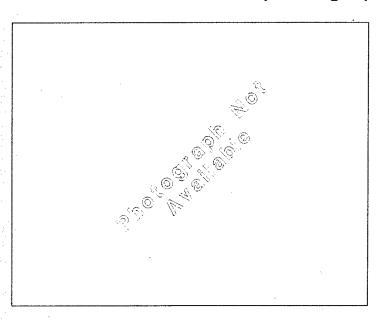


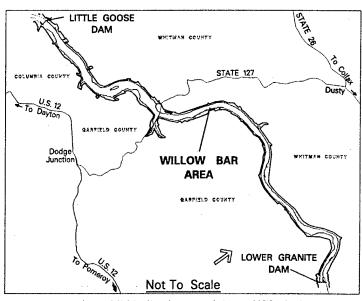
.





1992 aerial photography of Willow Bar area.





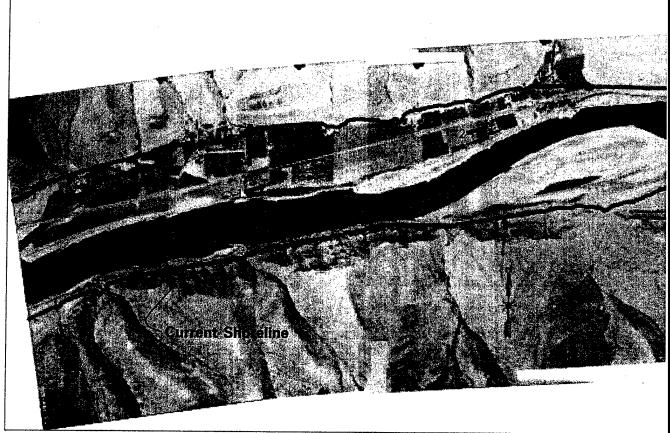
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

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Figure 17.
WILLOW
BAR AREA



1958 aerial photography of Penawawa area.



Photo 1. Right Bank, Penawawa area, 1958 oblique.

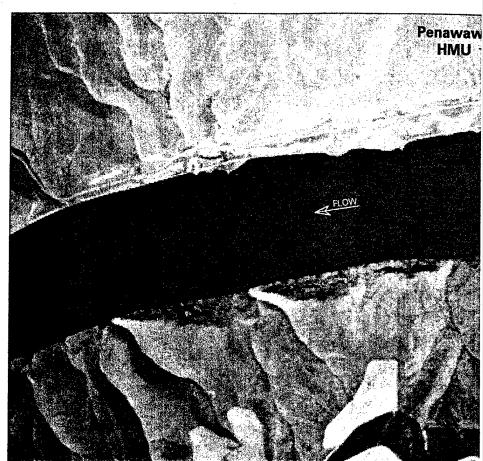


Photo 2. Right Bank, Penawawa area, 1958 ot





awawa area.



1992 aerial photography of Per



Right Bank, Penawawa area, 1958 oblique.

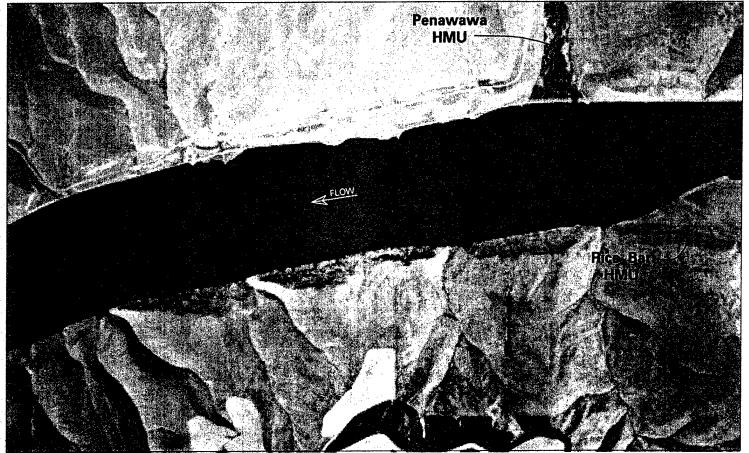


Photo 3. Right Bank, Penawawa area, 1958 oblique.



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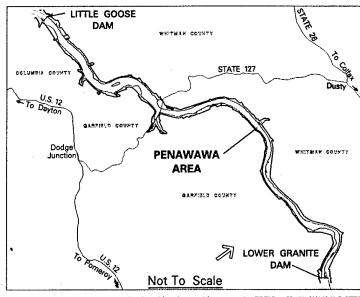




1992 aerial photography of Penawawa area.



Photo 3. Right Bank, Penawawa area, 1958 oblique.



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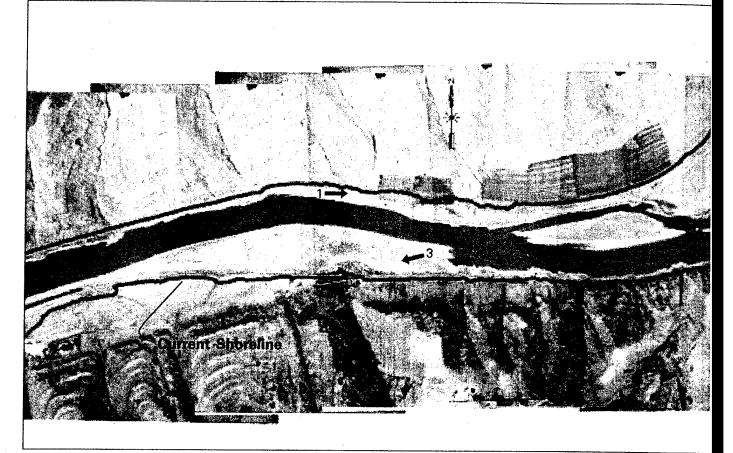


LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 18.

PENAWAWA AREA





1958 aerial photography of Shultz Bar area.



Photo 1. Right Bank, Shultz Bar area, 1958 oblique.

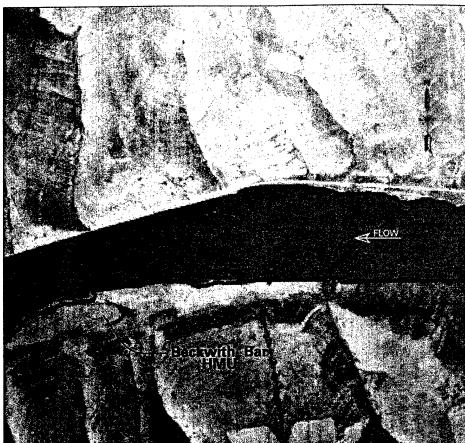


Photo 2. Left Bank, Shultz Bar area, 1958 oblique





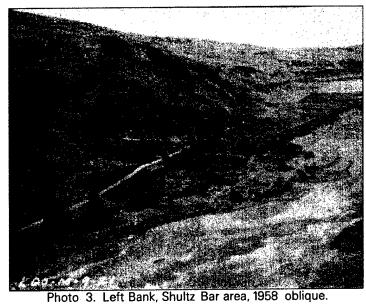
ultz Bar area.



1992 aerial photography of Sh

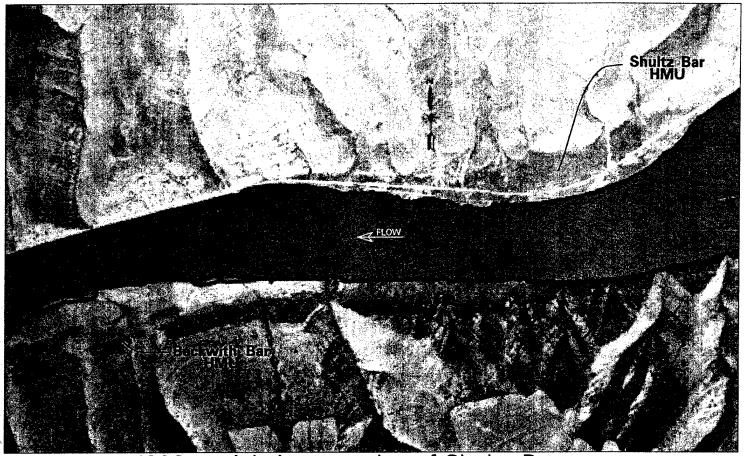


2. Left Bank, Shultz Bar area, 1958 oblique.





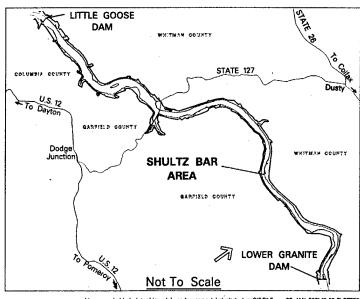




1992 aerial photography of Shultz Bar area.



Photo 3. Left Bank, Shultz Bar area, 1958 oblique.

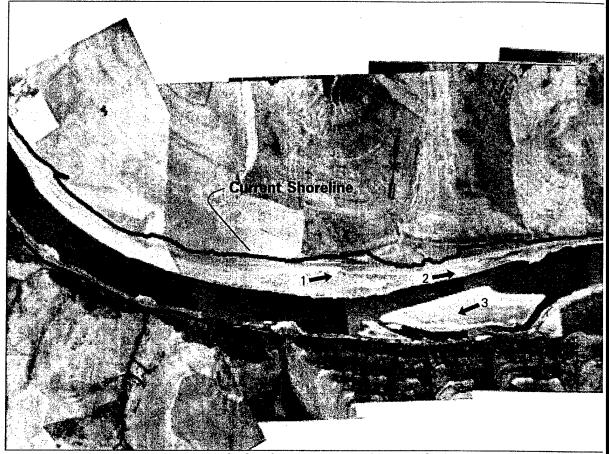


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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 19.
SHULTZ
BAR AREA



1958 aerial photography of Atwood area.



Photo 1. Right Bank, Atwood area, 1958 oblique.

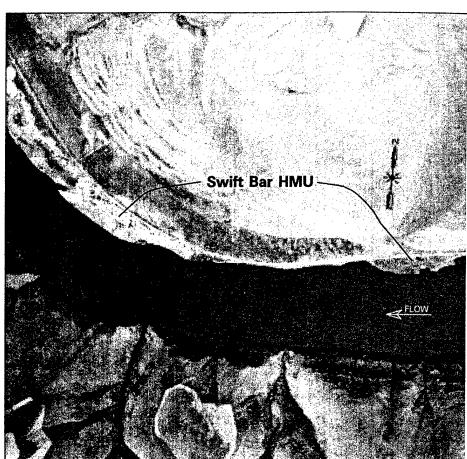


Photo 2. Right Bank, Atwood are





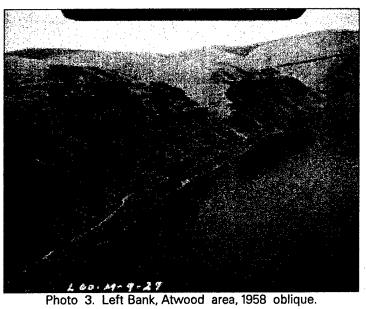
twood area.



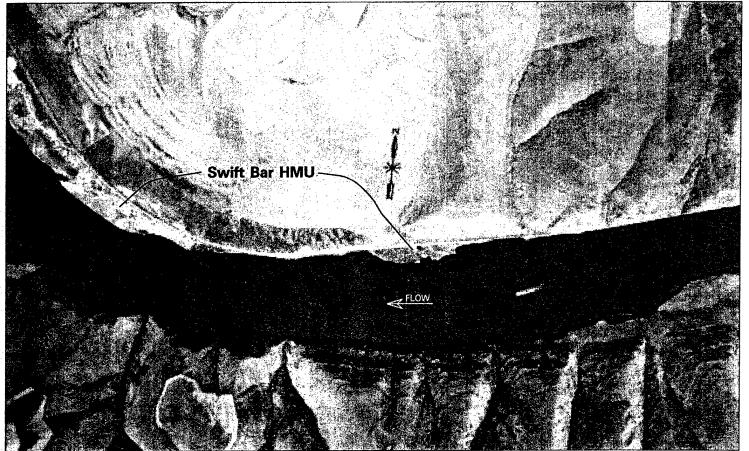
1992 aerial photography of A



2. Right Bank, Atwood area, 1958 oblique.







1992 aerial photography of Atwood area.

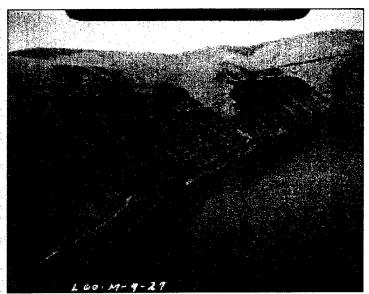
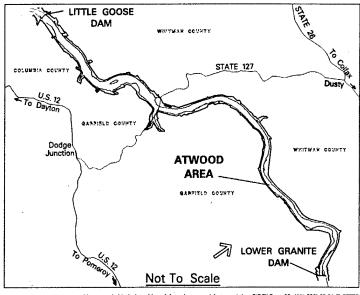


Photo 3. Left Bank, Atwood area, 1958 oblique.



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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 20.

ATWOOD

AREA

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1958 aerial photography of Almota area.

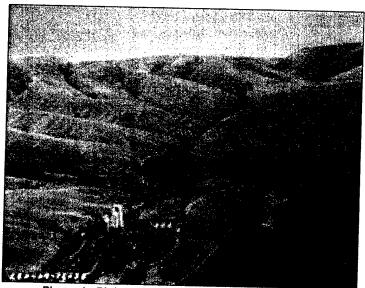


Photo 1. Right Bank, Almota area, 1958 oblique.



Photo 2. Left Bank, Almota area,





raphy of Almota area.

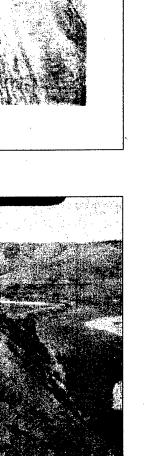


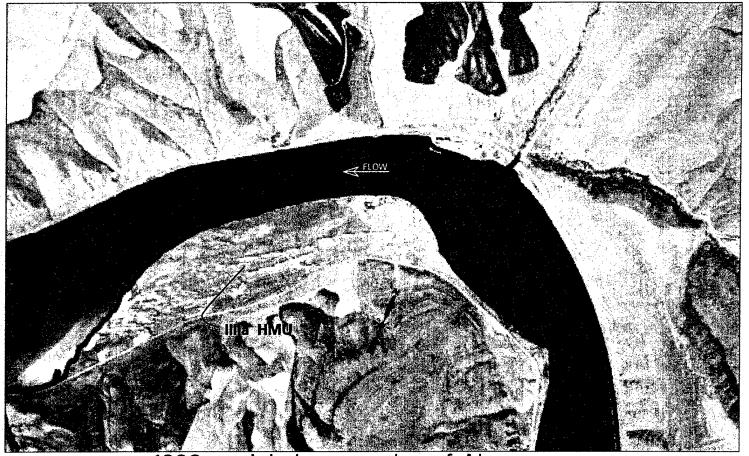
Photo 2. Left Bank, Almota area, 1958 oblique.



1992 aerial photog



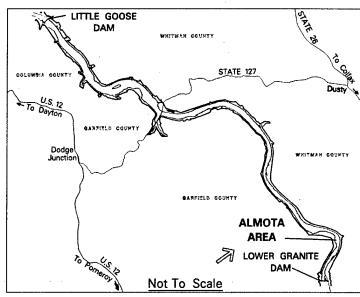
Photo 3. Left Bank, Almota area, 1958 oblique.



1992 aerial photography of Almota area.



Photo 3. Left Bank, Almota area, 1958 oblique.



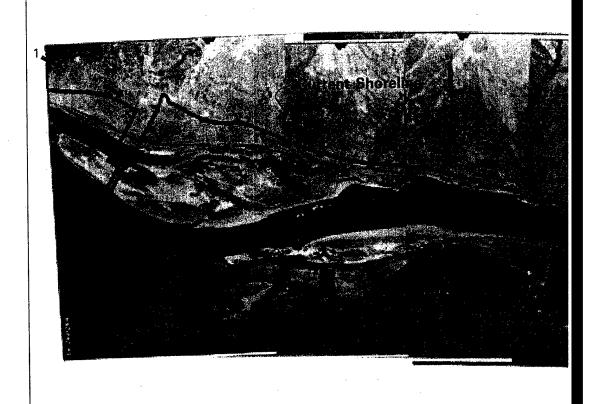
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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 21.

ALMOTA AREA



1958 aerial photography of Lower Granite [



Photo 1. Right Bank, Lower Granite Dam area, 1958 oblique.



Photo 2. Right Bank, Lower

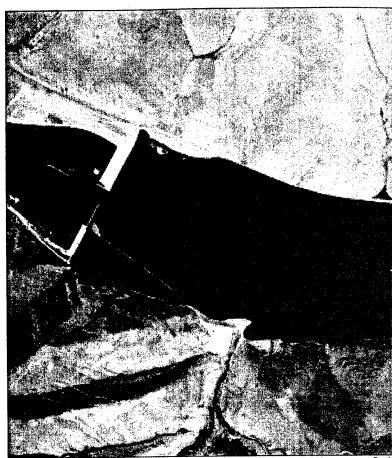




ower Granite Dam area.



Photo 2. Right Bank, Lower Granite Dam area, 1958 oblique.

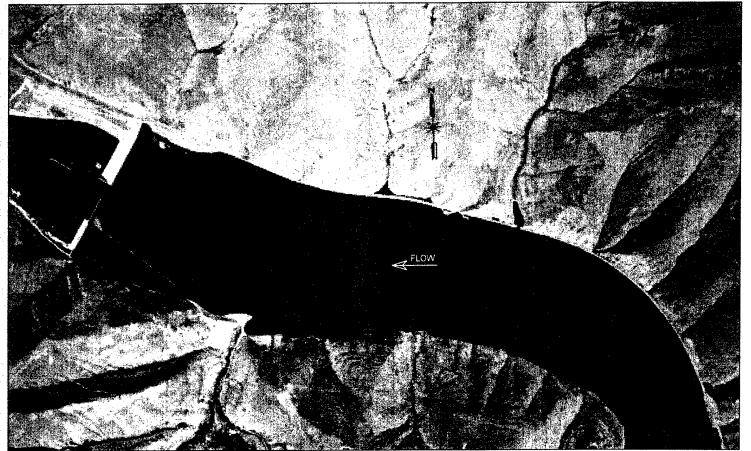


1992 aerial photography of



Photo 3. Left Bank, Lower Granite Dam area, 1958 oblique.





1992 aerial photography of Lower Granite Dam area.

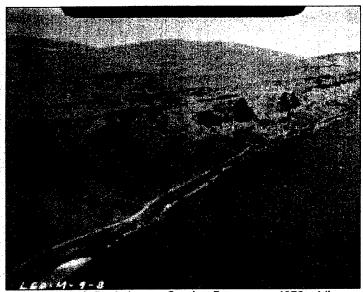
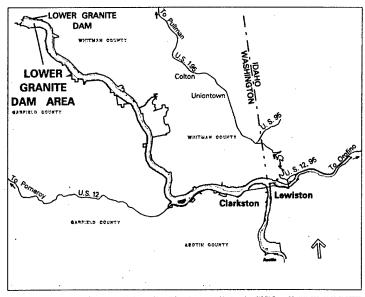


Photo 3. Left Bank, Lower Granite Dam area, 1958 oblique.



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LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study

Figure 22.

LOWER GRANITE

DAM AREA